S. Hrg. 100-661

GROUND WATER PROTECTION

JOINT HEARINGS

BEFORE THE

SUBCOMMITTEES ON WATER RESOURCES, TRANSPORTATION, AND INFRASTRUCTURE, AND HAZARDOUS WASTES AND TOXIC SUBSTANCES

OF THE

COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

SECOND SESSION

ON

S. 20, S. 1105, and H.R. 791

FEBRUARY 23, MARCH 24, AND MAY 17, 1988

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GROUND WATER PROTECTION

TUESDAY, FEBRUARY 23, 1988

U.S. Senate, Committee on Environment and Public Works, Subcommittees on Water Resources, Transportation, and Infrastructure and Hazardous Wastes and Toxic Substances,

Washington, DC.

The subcommittees met, pursuant to notice, at 9:40 a.m., in room 406, Dirksen Senate Office Building, Hon. Daniel Patrick Moynihan (chairman of Subcommittee on Water Resources, Transportation, and Infrastructure) presiding.

Present: Senators Moynihan, Baucus, Mitchell, Reid, Graham, Stafford, Chafee, Durenberger, Symms, Warner, and Pressler.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator **Baucus**. The joint subcommittees will come to order.

This is the first of several ground water hearings being held jointly by two subcommittees. What we're trying to establish is a coherent policy for the Nation's ground water.

Senator Moynihan and I are holding these joint hearings. He is scheduled to be here at any moment. However, we are proceeding since he is temporarily delayed. Senator Moynihan was to open these hearings.

He and I, are interested in legislation to consider ground water policy. Seated are Senator Durenberger and Senator Reid who also are extremely interested in attempting to set national policy for our Nation's ground water.

It's quite important that we move expeditiously for several reasons. For one, most of our drinking water, in one form or another, comes from our Nation's ground water. It's very important to our health, to our citizens, and to our general environment.

Second, ground water does not respect natural or State, or national boundaries for that matter. Therefore, it is important that we develop some kind of national ground water policy.

As an additional problem, we do not have a current policy for ground water today. We have the ambient standards for air in the Clean Air Act; the control standards for surface water in the safe drinking water statute, but we do not have standards for this Nation's ground water. The Senate recognizes the difficulties in attempting to set those standards because the nature of ground water is so different from air and clean surface water and drinking water standards for our communities.

We now must deal with other problems that have been developed in the area of these groups as expeditiously and as accurately and deliberately as we can to attempt to set the current policies.

[Senator Baucus' written statement follows:]

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Today's hearing begins a series of joint subcommittee hearings which Senator Moynihan and I plan to hold on ground water.

Over the next several weeks, I plan to introduce legislation complementary to the legislation which we will be developing here. As part of the RCRA reauthorization, I plan to introduce legislation calling for the proper disposal of the this nation's solid waste calling through the use of technology which will protect ground water.

The 1984 RCRA legislation set a standard of treatment over land disposal to protect ground water from the threats posed by ultra-hazardous waste. Many other types of solid waste have now been found to be threatening ground water. Protection must guide the protection of ambient ground water quality.

Source controls on solid waste streams such as municipal landfills, mine waste, petroleum production waste, industrial landfills, surface impoundments, municipal sewage sludge, and other waste piles can compliment and strengthen the establishment of a national ground water strategy. It is logical that both a comprehensive ground water bill and the RCRA reauthorization should move forward.

NEED FOR NATIONAL GROUND WATER POLICY

Ground water water is an irretrievable natural resource. In many areas of the country, its presence determines whether an area is habitable.

While the Clean Water Act established a nondegradation policy for surface water and the Clean Air Act established a policy to protect public health and the environment, no policy exists for ground water.

A clear congressional policy on ground water is needed to guide the nation in cleaning up wastes, protecting the resource and insuring the continued availability of clean, healthful ground water.

The ground water resources of this Nation must be protected from degradation. Only activities fully protective of public health and the environment should be condoned.

VULNERABILITY OF GROUND WATER

Almost a decade ago, Love Canal focused this Nation's attention on the vulnerability of ground water. Since then the problems posed by indiscriminate waste disposal has led to the establishment of a multi-billion dollar Superfund Program.

The folly of dumping wastes with little or no forethought is going to haunt this country for years to come. Illness, premature death, destroyed natural resources and astronomical costs to the economy will be a constant reminder of the short-sightedness of this approach. Action is needed now. Ground water is the life-blood of rural America.

NEED TO UNDERSTAND THE RESOURCE

Our understanding of the extent, the nature and technologies to protect ground water is rudimentary at best and in many ways largely non-existent.

We must gain an understanding of the resource as we push technology to find ways to protect it.

THREE PRONGED ATTACK

The legislation being considered today—to set a national policy and establish a major research effort between EPA and U.S.G.S. will form two legs of a national ground water strategy. The reauthorization of an expanded RCRA program can provide the third leg of a well-rounded national ground water strategy.

STATE ROLE—NEED FOR ACTION

I am becoming increasingly concerned over feasibility of having each State going its own way while ground water ignores State boundaries.

I have been deeply concerned over ground water standards or the lack of ground water standards. GAO at my request has been conducting an investigation of this process. Early this month, GAO issued the first of a series of reports that I requested.

This report identifies what individual States are doing.

Briefly, 41 States have set either numeric or narrative standards. While many States identified the need for consistency, GAO found little consistency. What little consistency GAO did find was between States who relied upon Federal drinking water standards.

This lack of consistency is very troubling. The use of public water supply treatment standards as a discharge standard is unacceptable.

A vast portion of America relies upon private individual wells. In many areas, community treatment of water is both technically and financially impossible. Allowing ground water to be degraded up to a standard above which it would require treatment is as foolhardy as our past waste disposal practices that led to Superfund.

I for one could never accept a policy that could, as a national policy, result in the treatment of each individual well. Rural America can't afford and doesn't want this type of policy.

CONGRESS NEEDS TO ACT

I look forward to hearing from today's witnesses and working for a clear concise national ground water policy. At the same time, I plan to move forward with legislation to reauthorize RCRA so that this committee can develop a truly comprehensive ground water strategy.

Senator **Baucus**. We have a statement from the chairman of the full committee, Senator Burdick, which will be made part of the record at this point.

[The statement referred to follows:]

Opening Statement of Hon. Quentin N. Burdick, U.S. Senator From the State of North Dakota

I am pleased to join my colleagues, Senators Moynihan and Baucus in these hearings on National Ground Water legislation. As a westerner from a farming state, I know that ground water is our lifeblood. In rural areas up to 97 percent of our citizens use ground water for drinking. Our ground water resources make up a water supply 50 times greater than that available from surface water sources—rivers and lakes.

But that supply is not inexhaustible. Even the huge Ogallala Aquifer—which covers eight Great Plains States—is being pumped down faster than nature replenishes it. This aquifer nourishes some of the most productive agricultural land in America.

Another problem is that pollution threatens the good quality of our ground water. In most areas ground water is not treated before use as drinking water, aside from some chlorination. But across the country, over 8,000 private, public, and industrial wells have been closed due to toxic organic chemical contamination.

The Superfund, clean water and safe drinking water amendments, which have come out of this committee can make a major difference in our Nation's water quality, if we can get adequate funding for their implementation. But my colleagues and I believe that a new Federal ground water law is necessary to protect ground water.

We believe that S. 20 and S. 1105 are steps in the right direction. We do not want to create another huge Federal bureaucracy—instead we want to keep the primary responsibility for ground water management with the States—and make the Federal Government responsive to States' needs. I have introduced an amendment to S. 1105 which sets up a task force among Federal agencies to develop the best management practices in agriculture to reduce nitrogen in surface and ground water.

I look forward today to hearing from the witnesses as to how we can improve these bills to forge a good partnership between the States and Federal Government.

Senator **Baucus**. With that we will begin our hearing unless Senator Durenberger and Senator Reid have opening statements.

Senator Reid.

OPENING STATEMENT OF HON. HARRY REID, U.S. SENATOR FROM THE STATE OF NEVADA

Senator REID. Thank you, Mr. Chairman.

You mentioned ground water. In a State like Nevada it is likely to lead to lengthy discussions and debate. How do we use it? How do we protect it? How do we study it? I'm pleased that this committee will be considering these questions as we examine Federal and State roles in ground water.

Water is a scarce resource in Nevada. In a major area like Las Vegas, our ground water resources can no longer quench the thirst of one of the Nation's fastest growing cities. Water in the Colorado river is expected to satisfy the needs of Las Vegas until around the year 2,000. In Reno and in the capital city of Carson the story is about the same. Our ground water resources cannot meet the demands. In short, high quality, readily available ground water is in short supply in my State.

While there may be a shortage of water in my State, there is no shortage of research in ground water and surface waters. The Environmental Protection Agency has a national laboratory in Las Vegas and a major responsibility of the laboratory is to evaluate and develop methods through the monitoring of ground water. The Desert Research Institute Water Resources Center has long been involved in studies of ground water with an increased emphasis being given to studies of ground water quality. The Environmental Research Center at the University of Nevada at Las Vegas has some of the finest analytical capabilities in the Nation for analyzing increased levels of contaminates in ground water. The U.S. Geological Survey, as in most States, continues to conduct important studies of waterfall, water quantity. And then there is the Department of Energy. They are conducting ground water studies at the Nevada test site, and they got the proposed resting spot for billions of curies of high-level radioactive waste. In short, significant research in ground water is being conducted in Nevada by a variety of institutions and firms.

This committee's efforts could further the utilization of this research by the rest of the Nation. Coordination of the research on ground water at Federal agencies is a major focus of this committee. Reporting of that research to the States, to shoulder major responsibilities for the management of ground water, is vital at the local level to those ground water professionals who must manage and protect our ground water. I support additional steps to coordinate research in ground water.

I also support strengthening existing and creating additional ground water institutes to serve as focal points for research. If the present ground water research being performed in Nevada is any example, there is an insatiable thirst at the State level for more knowledge and tools to apply to the management, protection, monitoring, and treatment of our ground water.

Regional centers of ground water research—similar to what is being developed in Nevada—serve not only the unique needs of the region but also some of the needs of the rest of the Nation. I believe more can be done to coordinate the research in ground water and still more can be done to disseminate the results of that research. Ground water research institutes have a role to play in these efforts.

Mr. Chairman, the bills before this Committee attempt to strengthen the Federal and State role in ground water in several ways. Additional money would be authorized for ground water research. This, in principle, appears to be good. However, at a time when Federal agencies are being asked to do more with less, it is the money which we appropriate rather than authorize that should serve to measure how effectively we're handling our environmental problem.

If we look at the existing research and program office budgets for EPA, the argument could be made that current appropriations for many existing programs are certainly not enough. One example would be the development of ground water protection strategies for States to reduce the potential contamination of sole-source aquifers on ground water recharge areas. The question that I have is whether bills which establish separate and increased authorizations for ground water research represent real improvements over our current authorization and appropriations.

Mr. Chairman, I'm pleased that this committee is examining the role of the Federal, State, and local governments in the protection of our ground water resources. I look forward to hearing conferences in this most important area.

Senator BAUCUS. Thank you, Senator Reid.

Senator Durenberger.

OPENING STATEMENT OF HON. DAVE DURENBERGER, U.S. SENATOR FROM THE STATE OF MINNESOTA

Senator DURENBERGER. Mr. Chairman, in November of 1983 the Environmental Oversight Subcommittee held a hearing in this room on ground water contamination. It really was my first exposure to the ground water issues, although other members of the committee had been working on solving ground water problems for a long time.

The witnesses of that period in 1983 included three assistant administrators from EPA. I asked a specific question: What is the major threat to ground water quality in the Nation? In response, we heard for the first time that leaking underground storage tanks and leeching pesticides were a significant threat for our ground water. The headline maker that day was a witness from the State of Maine who told us that 11 million gallons of gasoline were being lost from underground tanks to soil and ground water in the State of Maine every year.

I'm pleased to say that since the 1983 hearings the Congress has tried to respond to the LUST and pesticide issues. In 1984, we had the regulatory program changed. In 1986, we passed the tank fitness program. In 1986, both the House and the Senate unanimously adopted ground water protection measures on the bill to reauthorize FIFRA.

In that context let me, on this issue, Mr. Chairman, make a simple point. Those are ground water protection programs, but nobody ever claimed that either one of those bills were going to write a new State control on the ground water resources. Early on the service station owners were concerned that leak-proof tanks would be too expensive. On the pesticide bill the chemical manufacturers will tell you that the MCLG's of the drinking water program were too tough. We thought the standards were there that their products could meet.

So nobody ever came and claimed that the tank program threatened the fundamental or traditional role of the State of Idaho or New York or Maine or Montana or Minnesota in the regulation of its ground water. Nobody from Nebraska or Kansas or Colorado or Nevada has ever said that the pesticide bill threatened their water rights established under State law.

My point is this, Mr. Chairman. We have no interest in regulating ground water or water rights. We do want to protect the quality of ground water. Some regulation may be necessary to accomplish that. There's no State tradition for preventing ground water contamination from pesticides. There aren't many good State programs for sanitary landfills or surface impoundments. Maybe the Federal Government can provide the leadership in these areas using some regulation.

But we don't need to regulate ground water. The LUST program hardly even mentions ground water. There is no water quality standard. There isn't any elaborate aquifer classification scheme. The tank program simply says to build a better tank, using better technology in the program. You do a better job installing the tank. You monitor your tank for leaks. That's the technology. We require that better technology and better practices be applied to a major source of ground water contamination. It does so without wrecking the water law and the traditional authorities of any State. In fact, perhaps nearly all of the States have duplicated our legislation with new laws of their own, because they didn't have a traditional program for underground tanks.

I could, Mr. Chairman, make up exactly the same case during the 1984 RCRA amendments which included a comprehensive technology-based program for the disposal of hazardous waste on a wide variety of subjects.

So, Mr. Chairman, we will see a lot of people wave the banner of States' rights during the hearing. Others, I hope will show in their testimony they have a legitimate concern for important State institutions created to greatly resolve difficult water problems. But, I wonder, just who is threatening these institutions? Why all of the concern? Might it be that some of the folks marching under the banner of States' rights are just folks who don't want their tanks, their dumps, their pits, their ponds, their lagoons, and their chemical products effectively regulated to prevent ground water contamination? I would hope that's not the case.

Senator **Moynihan**. Mr. Senator, could you say that again?

Senator **Durenberger**. Might it be that some of those folks marching under the banner of States' rights are just folks who don't want their tanks, dumps, pits, ponds, lagoons, and their chemical products effectively regulated to prevent ground water contamination?

How long was the shuttle wait?

Senator Moynihan, you're a fantastic chairman.

Ground water protection legislation may represent a departure from what we have done in the past in the sense that it will be comprehensive rather than source-by-source. But it doesn't represent, in my book, any new challenge to traditional State authorities.

So, Mr. Chairman, in closing, I make a second point. I think everyone in the room would agree that the Clean Water Act is a big Federal environmental program that works. It made a substantial contribution to improve and protect and conserve water quality over the past 16 years. And it is, by-the-way, a technology program. It doesn't regulate rivers and lakes. It controls the discharges from point sources, all industrial point sources. It's comprehensive, using the best available technology. I think most people would agree with that description of the Clean Water Act.

But do you also know that it may no longer be the biggest Federal water pollution control program. In the President's budget for 1989, construction grants were allocated $1.5 billion. Superfund, which is the ground water protection program, comes in at $1.6 billion. Add to that the expense of ground water cleanup at Federal facilities and the phaseout of the construction grants program and you realize the role of the Federal Government is already shifted, perhaps. By 1990 or so we will say with our own budget, the Federal budget—with the dollars of the American taxpayers—that ground water contamination, not surface water pollution, is the more important Federal priority.

There is, of course, a problem with this new priority. Superfund is a cleanup program. It is not a prevention program. Strict liability for pollution should be preventive, but it hasn't worked out that way in practice. So, we have a big Federal ground water cleanup program.

It makes no sense to me that we should, on the one hand, have a $1.6 billion ground water cleanup program—90 cents on every dollar of Federal funds—and hear, on the other, that we dare not write a comprehensive prevention program because that would infringe on the traditional rights of the States to protect ground water. Where were the States during the Superfund debate? Did anyone hear them say, "Hey, this is my job. Don't let the Federal taxpayer bail me out." Of course not.

If we are to sustain this substantial Federal commitment to ground water, then at least some of our effort must be directed to prevention. I think we need a ground water pollution prevention program like the Clean Water Act, one that's comprehensive and one that focuses on points of discharge, one that relies on good technology and good practice to stop pollution, one that is conducted in a partnership with the States in the traditional environmental partnership.

I think that is the kind of legislation that I would like to characterize the legislation that I'm going to introduce later this week. It will be like that.

So Mr. Chairman, it is going to take us a long time to put another ground water protection program together, particularly a comprehensive one. In the meantime, I would join my colleague from Nevada who urged on us our attention to the issue of research.

I think we all know that we have research legislation before us, introduced here by our distinguished colleague, the chairman of this committee. The House has already gone through a lot to produce a good bill and I told them I would hope that we could act quickly on that phase of it.

I thank you, Mr. Chairman, for holding these hearings.

Senator **Moynihan**. We thank you, sir.

There's the elemental question about the distinction between these two kinds of resources. If surface water is polluted, pollution will go away if the water flows and makes its way to the ocean, whereas ground water—particularly in the case of sole-source aquifers—generally speaking, the recycling is very difficult, in some cases impossible.

Senator **Durenberger**. It was interesting the way we watched the 700,000 gallons of Ashland oil go down the Monongahela for about four or five days, and then it disappeared. But there's another 100,000 gallons that are currently in a little plumb working their way down into the ground water near Pittsburgh, and because we can't see that, it can't be televised and reproduced throughout the USA.

Senator **Moynihan**. I think that is a fact.

Mr. Reid.

Senator **Reid**. Mr. Chairman, I'm going to have to leave to give a statement on the floor. I'm going to return. I think this is—from a desert State like Nevada—one of the most important hearings that could be held in the Congress this year. I'm vitally interested in it. I congratulate you and Chairman Baucus for combining to hold this hearing. Again, for the people of the State of Nevada, it's vitally important.

Senator **Moynihan**. Can I just make the point that the State of New York has plenty of rainfall, and still, on Long Island, three million persons drink out of one well. It's called the Magothy Aquifer. It's pretty well understood by geologists, but not necessarily by public officials.

Can I ask my colleagues to forgive me? The shuttle wasn't delayed. They just announced it was not leaving at 8:30 a.m., that's all.

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, U.S. SENATOR FROM THE STATE OF NEW YORK

Senator **Moynihan**. I have a statement that I will put in the record at this point.

[Senator Moynihan's statement follows:]

Opening Statement of Hon. Daniel Patrick Moynihan, U.S. Senator From the State of New York

I welcome you this morning to this joint hearing on ground water legislation.[1] I am delighted to be joined by my colleague, Senator Max Baucus of Montana, chairman of the Subcommittee on Hazardous Wastes and Toxic Substances. This is the first of two hearings scheduled before this committee in the 100th Congress. We are here today to receive an update on the efforts at the Federal, State, and local levels to conserve our ground water resources. Today we will hear primarily from Federal agencies and national organizations with a demonstrated expertise in groundwater.

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[1] Sources of Data: Patrick, Ruth, et al., *Groundwater Contamination in the United States* (2nd ed., 1987); The Conservation Foundation, *Groundwater: Saving the Unseen Resource* (Final Report of the National Groundwater Policy Forum 1987); Office of Technology Assessment, *Protecting the Nation's Groundwater From Contamination* (1984).

We have made every effort to accommodate a representative sampling of those interested in this issue in the space of the 2 days of hearings. If you have remarks or comments to submit, please write to me and I will see that they are recorded.

We are especially pleased to have with us Hon. Lee Thomas, Administrator of the Environmental Protection Agency, and Assistant Secretary Lawrence Jensen of EPA and Assistant Secretary James Ziglar of the Department of the Interior. Lee and I were both speakers at an Environmental and Energy Institute symposium on ground water held here in the Senate this past spring. I was happy to observe then that Lee Thomas and I shared many of the same thoughts about ground water regulation.

The problem of ground water contamination is not new. Throughout the 18th and 19th centuries, ground water and surface water contamination were responsible for outbreaks of many infectious diseases such as cholera and typhoid fever. In 1854, Dr. John Snow found that by closing a well—by breaking a pump handle—he stopped an epidemic of cholera in London.

Today ground water is the source of drinking water for more than 50 percent of the total U.S. population and for 97 percent of rural residents. According to GAO, use of ground water is increasing at a faster rate than the use of surface water. The United States used 34 billion gallons of ground water per day in 1950. In 1980, that figure almost tripled to 89 billion gallons per day!

PURPOSE OF THESE HEARINGS

The purpose of the hearing today is to gather specific comments on S. 20, the Ground Water Protection Act, and S. 1105, the Ground Water Research Act, which is also an amendment to S. 20. Moreover, since December the House passed H.R. 791, the Geological Survey Water Resources Organic Act, which came to this committee, we will hear testimony about that bill.

Our goal is to incorporate the best features of these bills and new ideas from our witnesses into an effective ground water bill we can send back to the House, thus beginning a conference. Let me say at the onset that we are not interested in creating a new Federal bureaucracy to manage ground water. Rather, we want to build on the good foundation set by a number of States, and provide incentives for States which do not yet have adequate programs. We want to strengthen the research capabilities and to improve coordination among the EPA, U.S. Geological Survey and Department of Agriculture. We want to assure that every State has a workable ground water managment plan, suited to its particular needs. We want to be sure that the States are getting the kind of information and assistance they need from the Federal Government.

A BIT OF PERSONAL WATER HISTORY

In January 1977, I became a member of the Water Resources Subcommittee of the Senate Committee on Environment and Public Works. (At the time I was, I might add, the only subcommittee member representing a State east of the Mississippi!) In May 1980, in a shuffle of subcommittee chairmanships brought on by the departure from Capitol Hill of Senator Edmund S. Muskie to the floodplains of the State Department, I became the chairman of the Water Resources Subcommittee—the first easterner to hold that position since Prescott Bush, the father of our Vice President, in 1953. My tenure as chairman of the subcommittee failed to outlast the drought which afflicted 80 percent of our country between 1980 and 1981. As the 97th Congress convened in 1981, I was relegated to the position of ranking minority member.

But in the 100th Congress, I am chairman of a more expansive Subcommittee on Water Resources, Transportation, and Infrastructure. We have effectively reconstituted the old Senate Public Works Committee. My interest in and dedication to public works in general and to water policy in particular has not been dampened!

I first introduced the Sole Source Aquifer Protection Act in 1982—which later became part of the Safe Drinking Water Act amendments passed by the 99th Congress. The Sole Source Demonstration Program and the wellhead protection provisions in the Safe Drinking Water Act can contribute to better ground water management. Unfortunately neither program has been recommended for funding in the President's last two budgets. Similarly, the $400 million Nonpoint Source Control Program in the Clean Water Act amendments can make a difference, if it receives funds. Moreover, the Superfund amendments passed last session have several elements to clean up and safeguard ground water—notably a $500 million program to repair and replace leaking underground storage tanks. So Congress has made a substantial beginning, but my committee colleagues and I agree that the time is here for a Federal ground water statute which concentrates on ground water specifically.

WHY WE CANNOT AFFORD TO WAIT

Even though my colleagues and I may differ on some details or emphases in Federal legislation, we are united in our conviction that we must work together to steward a resource upon which over half of the population nationally, and over 97 percent of the population in rural areas depends upon for drinking water. Whether it is the vast Ogallala Aquifer which covers eight Great Plains States, and runs to a thickness of 1,000 feet in some places—or the Long Island Aquifer which is the sole drinking water supply for over 3 million New Yorkers—the need for protection is the same.

THE COMPLEXITY OF THE WATER CYCLE

We need to appreciate just what a complex and delicate cycle upon which we depend. The Magothy Aquifer on Long Island supplies 90 percent of Nassau County's drinking water, because the shallower glacial aquifer above the Magothy has been polluted to a great extent. In the Magothy, it takes approximately 800 years from the time precipitation falls on the center of Long Island for water to percolate down through the substrata to join the ground water, and to move slowly out to a point seaward of the barrier islands like Jones Beach. In the Lloyd Aquifer, the deepest of the three major aquifers, that process takes 3,000 years. What this means simply is that once contaminated, an aquifer takes hundreds of thousands of years to cleanse itself naturally.

So the water that most Long Island residents drink is hundreds of thousands of years old. The reason that it remains drinkable is that there are still enough undisturbed water shed areas to allow this ponderous cycle to function. However, development is relentless and pollution sources are growing. Water suppliers cannot continue drilling wells deeper or relocating them indefinitely.

What is happening to the watershed lands which protect and recharge Long Island's ground water? Development has greatly reduced these areas. As development encroached, natural vegetation disappears, and sources of contamination increase—contamination from landfills, industrial impoundments, highways, septic systems, and use of pesticides. Our agriculture, industry, domestic life, and our flora and fauna depend on this irreplaceable resource, which perhaps because it is unseen, is all too often taken for granted.

SOURCES OF GROUND WATER POLLUTION

A brief review of some current statistics enables us to appreciate the magnitude of the problem:

Contamination from toxic organic chemicals has made over 8,000 private, public and industrial wells unusable according to a study done in 1985 by the President's Council on Economic Quality.

Over the past 10 years, EPA reports that 10 percent of public ground water supplies have reported microbiological concentrations exceeding EPA health standards. In a 1984 study in rural areas, EPA found that two out of three ground water supplies tested violated at least one EPA drinking water standards.

Out of over 900 Superfund priority sites, over 75 percent of those have evinced ground water pollution;

Of approximately 1.5 million underground storage tanks which store petroleum or other hazardous chemicals—Government and industry sources estimate that as many as one third of these tanks are leaking;

Other sources which threaten our ground water supplies include:

20 million on-site sewage disposal systems such as septic tanks and cesspools;

18,000 municipal landfills;

200,000 injection wells which inject brines and other fluids into Earth as part of oil, gas and other industrial processes;

WHAT SHOULD BE THE SHAPE OF FEDERAL LEGISLATION

Let me reiterate that as chairman of the Water Resources Subcommittee, I am willing to hear and debate different approaches to this legislation. However, in the interest of specificity let me say why I believe that my bill, S. 20, is a good starting point for a Federal bill.

S. 20 maintains State primacy in ground water management—the Federal Government should not dictate to the States how their water resources should be managed. Today, virtually every State already has a State statute in place that regulates quality or quantity of ground water. The States are in the best position to make decisions involving local uses of land and uses of water.

S. 20 recognizes that different stages of planning and management. However, State officials agree and have told Congress repeatedly that they need the U.S. Geological Survey, EPA, and the Department of Agriculture to perform basic research into ground water contaminants so that States need not embark alone on costly and time consuming research in order to classify their state waters.

Our bill would direct EPA to perform research on ground water contaminants and to provide States with criteria documents specifying the physical, chemical, biological and radiological properties to contaminants and their risk to human health at various concentrations.

Using with a common set of federally developed data, the States will set their own ambient standards, which in general, must be at least as stringent as those for drinking water in the Safe Drinking Water Act. But States are free to designate areas with more or less stringent standards, depending on the use of the water and the treat to human health and environment.

S. 20 originally authorized $25 million a year over 3 years on a 75 percent Federal, 25 percent State basis for States to perform these ground water assessments. In addition, the bill provided $50 million over 5 fiscal years on a 50 percent matching implementing management strategies.

RESEARCH AMENDMENT STRENGTHENS S. 20

On April 18 along with Senators Burdick, Durenberger, Mitchell, Baucus, Graham, Chafee, and Stafford, I added a research amendment to S. 20. The purpose of this amendment is to strengthen and clarify the ground water research programs of the Environmental Protection Agency, the U.S. Geological Survey, and the U.S. Department of Agriculture to better provide accurate information to the States, which must bear the ultimate responsibility for protecting ground water resources. We took the unusual step of writing a very detailed research bill, because we recognize the complexities inherent in managing our ground water. We know there is an inseparable link between surface water and ground water quality. We know that the main sources of ground water contamination are from hazardous and municipal waste disposal, mining, and agriculture. but we still have much to learn about how chemicals interact with various biological and physcal components in the saturated ground water zones and aquifers.

Because it is so much less expensive to prevent ground water contamination than to reverse it once it has occurred, we must coordinate the impressive research capabilities of our Federal agencies to focus our efforts where they are most needed to protect public health. Less than one-third of the $285 million annual authorization in this amendment represents new budget authority. However, a coordinated ground water research program is an investment that will pay many dividends in both the near and long term. We cannot afford not to know that we are doing and why when it comes to managing our water resources. Dollars wisely invested now will save costly mistakes later, as we learn to apply our scarce fiscal resources where they will most benefit public health.

I appreciate that those of you here today share my interest in this irreplaceable resource, and I will listen eagerly to the suggestions you have on our ground water legislation.

Senator MOYNIHAN. It's a great pleasure, as it always is, to have the Hon. Lee Thomas appear before us, the head of the U.S. Environmental Protection Agency. Mr. Thomas, would you come forward and bring any of your associates that you might like to have with you?

Mr. Jensen, we welcome you as well, sir. You're the Assistant Administrator for Water, I believe.

STATEMENT OF HON. LEE THOMAS, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY LAWRENCE J. JENSEN, ASSISTANT ADMINISTRATOR FOR WATER

Mr. THOMAS. Thank you, Mr. Chairman.

I appreciate very much the opportunity to be with you and members of the committee today to discuss an issue that, as Senator Reid said, is of critical importance to the United States. You have a copy of my written testimony. If it serves your purpose, I'll highlight that testimony for you and submit that for the record.

Senator MOYNIHAN. Please do, but please take your time. We want to hear you.

Mr. THOMAS. I have been at EPA now for about 5 years, as a matter of fact, 5 years this week, and it has been an interesting time. During that entire period of time I have dealt with the issue of ground water contamination, because as you know, when I came to EPA it was to manage the hazardous waste programs. As Senator Durenberger has said, the primary focus of those programs is either contamination prevention or contamination cleanup in ground water. Then, over the last 3 years as Administrator, I have found that the issue of ground water is a major issue in our other programs: the pesticide program, the drinking water program, and others. Ground water contamination—how do we prevent it, how do we clean it up—is a major component of those programs.

During these 5 years I have come to believe that the issue of ground water contamination is an important issue for this country to deal with. It's an important environmental issue. It's an important water resource/economic issue.

I've also come to conclude that, technically, it is one of the more complex issues. As has been said, cleaning up ground water is not easy. As a matter of fact, we seem to find that it's more difficult the more we work on it. I once said that I decided that it was not a science, it was an art form, trying to determine how ground water moves. What happens in the subsurface to contamination through fate and transport are things we need to know much more about. We need to know much more about it through a research program, which we have in place. We need to continue that, but technically it is indeed complex.

It also is a difficult public policy issue. Senator Durenberger has stated that the emotions surrounding the issue of ground water, as far as public policy is concerned—when you talk about State's rights versus Federal rights versus land use control, water quantity versus water quality—get mixed up. Who is going to control the ground water becomes a pretty tough issue to talk about, but it is important to talk about it. It's important to try and deal with it in the context of a public policy debate. I commend you for holding this hearing, as you have held hearings in the past, to talk about the issue of ground water contamination and how we should deal with it and what the Federal role should be.

In EPA, we tried to establish in 1984 what the role in the Environmental Protection Agency would be, as far as a Federal role across our many statutes, with a ground water protection strategy. We looked across the agency, recognizing the resource value of

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ground water and what needed to be done for protection. We put together an overall strategy that included a number of components.

First, it was based on trying to build or enhance, and in many cases it was enhanced, the ground water protection programs at a State level, recognizing—and I still have the belief—that State and local government really needs to be in the lead as far as ground water protection is concerned. So how did we build the capability, in States that didn't have it, to deal with the issue of ground water contamination? How did we work with States to enhance their capability if they already had it so that they, in fact, could have a better understanding of the contamination issues they faced and strategies for dealing with that contamination, particularly prevention strategies. So that was a major component of that strategy.

Second, there was a component which was based on expanding the controls at a Federal level where that proved to be necessary. It obviously proved to be necessary both by congressional will and Agency will. Again, as stated by Senator Durenberger, since 1984 we have expanded the control program, to a certain extent focusing on the prevention side more so than we did in the past.

The underground storage tank program, which Senator Durenberger indicated was discussed by an Assistant Administrator from EPA, was also discussed and dealt with at length by the Deputy Administrator of EPA and obviously by the Administrator since. It was a program to prevent contamination from leaking underground storage tanks. I do think we've made a good bit of progress in this country. I think Congress has been a major director of where we should go as far as that program is concerned. The agency has worked hard to move forward on the prevention and the cleanup side of the underground storage tank issue, which was a major issue. So we've worked to expand that.

We've worked to expand the pesticide program. We're looking at both how do we prevent the registration of pesticides that have high leaching capability, as far as the constituents of the pesticide, or the use of the pesticide.

We're also in the middle of looking at an overall strategy, both prevention and corrective action, for pesticides generally. As a matter of fact, in the next week or so we'll be publishing a major proposed strategy for public comment on pesticides in ground water which I've been working on with my pesticide people now for over 2 years.

We have also gone forward to implement the major revisions of RCRA that Congress put in place—the land ban revisions—which to a large extent were ground water protection or prevention provisions of RCRA. So we have expanded the controls significantly at a Federal level.

We have also worked for greater consistency in EPA decisions, both as far as prevention—how do we look at prevention, and do we look at prevention in our programs—and also cleanup levels. We have worked on consistency between what we do in the drinking water program, what we do in our hazardous waste program, and what we do in our pesticide program as far as cleanup is concerned, so we can have a consistent point of departure for cleanup which is a health-based point of departure. In some cases, should we be more stringent? In other cases, should we be less stringent?

On a site-specific basis looking at a differential approach as far as ground water is concerned—based on its use or potential use, and its existing contamination—making a determination from a point of reference for cleanup purposes.

We've also worked to have greater policy coordination not only within EPA but outside of EPA. We've established a Memorandum of Understanding with the U.S. Geological Survey in 1985 to insure that we work in a coordinated fashion with them; same thing with the U.S. Department of Agriculture. We have any number of interactive efforts between those agencies.

USGS is the major earth-science agency of the Executive Branch—clearly major expertise as far as ground water is concerned—offices in every State working with them at a Federal level. Trying to work through the environmental agencies at a State level back through the State geologist is a major concern and has been a major effort of ours and will continue to be.

So overall, the ground water strategy that was developed in 1984 had components that were important in EPA, outside of EPA, built on the responsibilities of the States, and talked about prevention and corrective action. We've moved forward and made a good bit of progress under it, and I think we've done it with tugging and pulling with Congress. But generally, we've gone along in the same direction with an increasing emphasis on prevention, an increasing emphasis on building State capability, an increasing emphasis on consistency as far as cleanup standards are concerned, but moving generally forward with a coordinated effort between agencies, State and Federal Government. Clearly not without bumps, and not without tugging and pulling, but we've made progress over that four-year period of time.

So do we need Federal legislation? Do we need additional statutory authority to deal with ground water? I've already indicated that I manage a number of statutes that are geared towards the issue of ground water contamination, either prevention or corrective action. So do we need more? We're working to integrate.

I must tell you that I am ambivalent in my answer. I have said, yes, we need national legislation and I have said, no, we don't. I'll say the same thing today, and let me qualify.

I thought I would take a judicious approach to that answer. Sometimes I think maybe I'm too close to the process to be objective about whether we need national legislation, because over that 5-year period of time, you and I, members of this committee, have really worked on national legislation related to ground water. We've had debates about it, and we've agreed on some things and we've disagreed on some things.

On the one hand, I think that we ought to have national legislation because I think the protection of ground water is a national issue and should be a part of a national goal. An objective that this Nation should clearly be behind is to establish the protection of ground water from contamination. We ought to state that. The best way to state that is through national statutory language. We do it in other areas for other things. Senator Durenberger talked about the clean water bill. Clearly, we established a national goal to clean up our surface water. Should we not have a national goal to prevent contamination of ground water? I would say yes, we should. So, as far as the need for national legislation to establish clearly our national will behind a national goal, I would say yes, we ought to have it.

Secondly, should we in that legislation ensure that there's consistency in our approach for dealing with ground water? I think there is an argument for consistency in the way we deal with ground water.

Third, should we have national legislation to ensure that we continue momentum behind the public concern, congressional concern, executive branch concern, State concern about ground water contamination? Momentum behind a research effort? Momentum behind an effort to build capacity at a State and local level? I would say yes, we ought to.

However, on the other hand, as I look at what we may get in national legislation on ground water I'm concerned that we would not, in that national legislation, embody principles which are key to an overall approach on ground water. And that is:

One, the discussion we've already had—or the point that's already been made by several people, including myself—a recognition of the State and local lead and the dominant role that State and local governments have to play, as far as ground water protection is concerned, because of the interactive process of quantity and quality issues, because of the land-use decisions associated with ground water protection; and the dominant role that State and local government should play. A leadership role that's supported by the Federal Government, not mandated by the Federal Government. But secondly, recognizing the Federal role as a role that clearly is required in a number of areas.

One, clearly there needs to be a strong research program at a Federal level on the issue of ground water contamination—all the way from a better definition of what the problem is that we're dealing with to a better definition of alternative methods for dealing with that problem.

Secondly, the Federal role on technical assistance and technical support, an increasingly strong role that's needed on the part of the Federal Government to provide the kind of technology development, technology transfer, and technical assistance that's needed at a State and local level.

A Federal role for cleanup where we've got a massive problem like we've got with Superfund. Clearly a role the Federal Government to step in and take on, as this country has done, a part of that responsibility.

A Federal role is needed for controlling toxic chemicals of national concern. I think you see in our pesticide program, in our toxic chemicals program, in programs like RCRA a Federal role for setting overall consistent standards to prevent or correct problems with contamination in ground water where we have identified a national need to deal with that—a pervasive need that can be dealt with by the Federal Government—like in a pesticides statute. It is clearly a strong Federal role that's required there, and in that regard, clearly, standard-setting is a part of that role.

Technology standards is a part of the underground storage tank program, and is a Federal role establishing the floor or establishing the ceiling for standards. In that case, technology standards was an appropriate Federal role.

Additionally, I think that Federal legislation would absolutely have to take into account what I call the differential nature of ground water, and the differential protection which should be associated with ground water that's already contaminated, ground water that may have no potential future use. Taking into account differential protection is a key both for prevention and corrective action.

Finally, differentiating between prevention and corrective action—as far as stringency of our programs and where we devote our resources—should be a major element of any Federal legislation.

Finally, I would hope that any Federal legislation that is adopted does not divert attention from important things by mandating too much. I see that in a lot of Federal legislation I deal with. Everybody wants something done, so it all gets rolled into the Federal statute with mandates behind it. We mandate too much. We spread our resources too thin. We don't give flexibility to highlight the important things, and we, in fact, divert our attention from some of the important things.

Second, that we don't enact requirements when dollars are not going to follow, and they're not. You're facing the same kind of budget decisions that we're facing in the administration. I'm frustrated over them. I'm frustrated over the fact that I've got an increasing gap between authorizing and appropriating committees. I've got the same dilemma in the administration when we fashion a budget.

I look at the wellhead protection provisions of the Safe Drinking Water Act. I work through a little small grant program to try to help the States with those provisions, and I didn't get an appropriation for it. I know why, because you all had to make the same kind of tough decisions that we have to make. And you decided that wasn't a priority, or whoever thought it was a priority wasn't at the table when the decision was made. But I see that in many other areas. So if we're going to have national legislation, face up to one, what are the dollar implications at a Federal level? And two, what are the dollar implications at a State and local level? Don't mandate a series of things that those State and locals have to do, or implications, without taking into account the dollars associated with them. They've got the exact same problems we've got, as far as dollars are concerned, in finding resources.

Finally, don't create in Federal legislation a bureaucratic process that's more of a mess than the one we generally have in the Executive Branch.

Senator MOYNIHAN. I don't think that we could do that.

Mr. THOMAS. Senator, I challenge you on that I think it's possible.

If you set up—in the view of ensuring consistency—committees that we then have to go through for clearance of things, in fact, you may well create just another layer of review and another layer of problems as far as just how you go about doing things. A little bit of duplication and a little bit of overlap aren't necessarily bad. A lot of talking with each other and working with each other is good, but the way to go about dealing with this problem, I believe, is that you need a number of agencies working on it at a Federal level. A number of agencies are working on it. Trying to make sure that we designate who's king out of those agencies might, in fact, kill the prince as opposed to moving forward with this problem. I just throw that out as a caution at the end.

So in conclusion, I think ground water contamination and the issues associated with it are a very important issue. I think a lot of progress has been made over the last four years in dealing with it, as many of you have already indicated in your statements. I would feel that progress would continue under the existing statutes. I believe it will. I think that you can pass national legislation that will help that process or hinder that process. I've thrown out a few highlights of concerns on both sides. I'll be pleased now to answer questions that you have about any of the things I've talked about or any of the other issues associated with this important subject.

Senator **Moynihan**. Mr. Thomas, may I just first thank you.

You've come before us as a career public official. We have the greatest regard for your integrity and also your knowledge. Those remarks about "a little overlap is not the worse thing" is a very perceptive remark of a person whose life is public service and public administration. And I, for one, listen with great attention.

Why don't we go immediately to questions. I know that each of us here will have more than just a few.

Senator Baucus?

Senator **Baucus**. Thank you, Mr. Chairman.

Mr. Thomas, you talked about the requirement—or at least the hope—that dollars follow the mandates and that we don't spread resources too thin. How do you recommend we allocate Federal dollars here? At what level should we fund Federal research and technical assistance to the States, given your experience in setting budgets and dealing with OMB and the Congress? What do you recommend?

Mr. **Thomas**. Well, I think that if you look at the current program on research you're probably talking about close to $200 million. I think that's a substantial amount of money. You may well not need any additional authorization beyond that. The idea of setting priorities within that and coordinating that effort is something that we're working hard on through an interagency group, particularly between EPA and USGS. I think we're getting a better handle on how we coordinate that; an awful lot of that money is USGS money, but a good bit is EPA as well.

One of the areas that I think we've suggested—you'll see it in our 1989 budget, but you also have endorsed it—is in the area of technology development associated with cleanup, particularly related to toxic chemicals. Under the Superfund program you authorized a research effort. When you reauthorized that, you've seen us increase resources there so we're now up to a $40 million or $50 million research effort that is largely oriented toward technology development. A good bit of that technology increasingly is associated with ground water.

Senator **Baucus**. Where is the greatest research need, the greatest technical assistance need?

Mr. **Thomas.** I would say the greatest technical assistance need is to continue to work with States to build their capability.

Senator **Baucus.** Can you give me some examples? You stated earlier that some States are falling behind, or at least somewhat deficient compared to some other States. Give me some examples of needed technical assistance.

Mr. **Thomas.** We've been working with States, particularly over the last three or four years, as they've worked to develop ground water strategies in each one of their States. We've got most of the States now that have either developed those strategies or are well along. They need some additional dollars to provide an infrastructure and staff capability to deal with development of a strategy and implementing of a strategy. You see some of our grant programs to increase a little bit the Federal dollars to help them out.

The second thing is that I think they need increased technical assistance from us, both in the form of the process of deciding what kind of prevention program is needed—the GAO report you asked for that recently came in talked about standard-setting. They work on the standard-setting process. I think the work we're doing under the drinking water program, as well as some of our other programs, is going to increase the kind of assistance in the form of information that the States need in the area of what I would call standard-setting.

Finally, I would say that under the technology area that cleanup technology, we've got to increase our capability to develop technology that will help as far as the cleanup program is concerned once ground water is contaminated.

The final area I would mention is one that you'll hear more about from the Department of Interior because I think it's the USGS role, working with the State geologists and bridging over to the State environmental agency, in better understanding just what the groundwater situation is from a geological point of view in a particular State and what it means in terms of quality problems, what it means in terms of contamination problems. Providing technical assistance down through the USGS State offices, up through the State geologists or State environmental agencies is an area that I think——

Senator **Baucus.** Can you give examples of any specific States that you've worked with and have achieved these kinds of results in helping the States, either through research or technical assistance? Can you give me some examples of States and dates, roughly?

Mr. **Thomas.** I could give you a pretty good report for the record, if you'd like. We've got 38 States we've worked with to develop the ground-water strategies. We have awarded about $7 million a year to the States to work on those strategies. You see some States—I'd say you've probably got 10 or 15 States that are pretty far out in front of a number of other States, States like Florida and New York and New Jersey——

Senator **Baucus.** If you could, for the record, list those States that you think are out front and those States that you think are not.

Mr. **Thomas.** I will do that. [See p. 103.]

Senator **Baucus**. Also, precisely what EPA has done in helping bring those States along.

Mr. **Thomas**. I'd be glad to do that.

Senator **Baucus**. Another question goes to prevention. I understand that perhaps EPA generally believes that the water supply should be regulated at a level set by the safe drinking water statutes; that is, that more responsibility should be on the well and the provider rather than on the polluter that may cause contamination of the well in the first place. Can you tell me where you draw that line? How much emphasis on the polluter, on prevention, and on the other hand how much burden should be placed on the provider of the drinking water in making sure that safe drinking water standards are met?

Mr. **Thomas**. Well, first, I think that as far as prevention versus cleanup is concerned, we should have a heavy emphasis on prevention to prevent contamination in the first place. As I indicated, I think that the underground storage tank program, which is aimed at preventing contamination, is an appropriate way to go in preventing contamination. I think the way we're trying to go in restricting or not allowing the use of certain pesticides is a way to go as far as prevention is concerned, and I don't think that a prevention program as a first step should be looked at as if we're going to contaminate up to a certain level. We want to prevent contamination, period.

Once you have a contaminated situation and you're looking at how we need to clean it up, I have used the Safe Drinking Water Act maximum contaminant levels as the cleanup level. In other words, the drinking water standard that we use is the standard. In some cases, I've suggested that we should clean up to lower than that standard. In other cases, I've suggested that we wouldn't need to clean up that high, largely based on the condition of the ground water itself, how that ground water is going to be used or could be used. But there is a sharp difference in my mind between how we go forward and set up a program for prevention purposes as opposed to what we do once we've got contamination.

Senator **Baucus**. Would you leave the decision of whether to clean up to—above or below—the safe drinking water standards to the States?

Mr. **Thomas**. It largely depends on what you're dealing with. For instance, in a Federal program, the kind I talked about—for instance, a RCRA program which deals with hazardous waste or a Superfund program—those programs that we've taken on as national mandates, no. I think that's a Federal standard. If the State wants to be more stringent, say under RCRA, they can be more stringent, but I think in many cases you've got a requirement for a Federal program where we've identified, either because of a toxic chemical or because of a pervasive source of contamination, that we're going to take that on as a Federal initiative, a Federal program.

Senator **Baucus**. One quick question. I think my time is probably up here, Mr. Chairman.

You suggested no Federal minimums. That implies that because ground water is different from air and surface water, it is unnecessary.

Mr. THOMAS. What's unnecessary?

Senator BAUCUS. For Federal legislation to set Federal minimum standards for ground water.

Mr. THOMAS. No, no. I don't agree with that. I think in some cases clearly that is required, just as we've done under Federal legislation.

Senator BAUCUS. I'm trying to get a sense, really, as to whether we should follow models of other statutes, like air and water.

Another example is reclamation, Federal open mine reclamation standards. States can set more stringent standards if they wish, but nevertheless that's an example. Reclamation is fairly indigenous to a State; it doesn't cross State lines very much, as air and surface water does.

So why not set good, tough State standards to move us along? And if States want to be more stringent, they can.

Mr. THOMAS. Well, in some cases I'm suggesting that I do see a similarity with that. I mean, that's exactly the approach that we've taken as far as hazardous waste is concerned in this country. We have set and are moving forward with a Federal program which sets standards. States can be more stringent than that if they want.

We have done that as far as our underground storage tank program is concerned.

I am suggesting that for certain sources, I think there's a rationale for a consistent Federal approach with States having the ability to be more stringent. I think in other cases—and particularly when you're looking at ground water and the kind of sources of contamination of ground water that we've got—in other cases it probably doesn't make sense for us to try to establish some kind of standard at a Federal level that in turn is going to drive everybody at the local level. The kind of contamination of ground water from septic tanks is an example. It's pervasive across the country, but I don't think I can set a septic tank standard at a Federal level. I've put out septic tank guidance——

Senator BAUCUS. But couldn't a Federal statute address those differences?

Mr. THOMAS. I think it could.

Senator BAUCUS. As to septic tanks, the different kinds of standards for different kinds of conditions.

Mr. THOMAS. Well, it clearly can address the fact that I think you should incorporate, as a component of a Federal program, a recognition that in many cases the State and locals are going to have to take the lead. Clearly, there can be an area of Federal standard-setting, Federal technical assistance. I think that differential protection has to be a component of all the programs, so that that can be incorporated as a component, whether it's State or whether it's Federal.

Senator BAUCUS. Thank you.

Thank you, Mr. Chairman.

Senator MOYNIHAN. Senator Durenberger.

Senator DURENBERGER. Thank you, Mr. Chairman.

Lee, I want to begin by thanking you for that statement, most of which was, I think, off the top of your head.

By way of reference I want to say that one of the pleasures for me, as a Senator, of serving now on two, it used to be three, committees with the Democratic Senator who is currently in the chair of this joint subcommittee is that there's always a consistency in Pat Moynihan's framework.

I think there's not a—what I might call at the beginning of this administration in EPA—a sort of ideological thrust to everything that got done. I find in working with you over the last 5 years we've had an incredible number of disagreements, if you just want to pile up the how to do it sort of disagreements. But there's always been a consistency of, at least, intellectual content in what you have brought here. And that's one of the reasons I love working with Pat Moynihan so much, whether it's the welfare reform finally getting to the Finance Committee agenda or the kind of work that he does in this committee, we can disagree on how to go about something. But we do that in a way that has a sense of reality to it, just like these last comments you were making about the space that currently exists between authorizing and appropriating, for example, which I understand you have to deal with.

I regret, in things like well head protection and so forth, that all the effort we put in ended up that some appropriator liked cranberries or blackberries or whatever it is better than they liked wellhead protection, and the whole system ran out of money. So I thought what I just heard you say there for 10 to 15 minutes was as good a capsulization of 5 years of experience with a variety of environmental programs as any of us are going to hear at any time.

I also want to thank you for allowing us to drag Marion Mlay out to Minnesota a couple weeks ago. I think it was the coldest week we've experienced in Minnesota. It was like −32. She came on the day of a blizzard and to her credit she didn't get any farther into the State than Rochester, which is sort of like coming to Florida when you come to the United States. It was only about 20 below, I think, something like that. But having the person who has the responsibility—and has for a long time in her professional life—for working with ground water programs on hand as we did hearings was a compliment to you and your involvement in this process.

Let me ask you a question, maybe two questions, with my time. As I listened to you list why we should have national legislation, but what we ought to be careful of, one of the things you didn't say specifically—but it always comes home to those of us who work in the area of the environment—you said we ought to recognize the State and local government's needs to relate quantity and quality. Whenever I think of that I think of the Ogallala and how much of that's getting pumped out for today's generation's need in Texas without much thought of the consequence. So that always brings us around to this——

Senator **Moynihan**. Do we know, do we have a number, some fix on that?

Senator **Durenberger**. Yes. I use it in speeches, but I forget the exact number. In 60 years we've taken out more than we'll replenish in 1000, something like that.

Senator **Moynihan**. In 60 years we've taken more than the normal——

Senator **Durenberger**. More than we could replenish, if we stopped taking it out today, in the next 1000 years.

Senator **Moynihan**. Would that be the geological survey? Would they have done that?

Senator **Durenberger**. I would imagine, yes.

So when we talk about quantity and quality I can understand it in this generation's context and in the needs that States have, too. But I also get concerned about the generational consequences and then that also brings me to this balance between cleanup and prevention since prevention's a generational strategy.

So let me ask you about this proposal you're going to be coming out with, in terms of pesticides, in your strategy. One of the things that the Agriculture Department always moves in our direction is a risk-balancing regime. I'm sure that's something that always comes up with regard to FIFRA. I would be concerned about using risk-balancing when we're talking about ground water and pesticides, because the same people that are using the pesticides are the ones that have to depend on the ground water for their drinking. Do you think that we need a health-based approach, rather than a risk-balancing approach, in order to get the right instructions on pesticide labels and the other things we need to do?

Mr. **Thomas**. No. As a matter of fact, I think the risk-balancing approach that is a component of FIFRA is a good approach. I don't see any other way that you can deal with the tough issues you've got to deal with there other than having the ability to do risk-balancing. Clearly, your bent is on protecting human health and the environment, and you've got a good bit of flexibility to do that.

For instance, the ground water issue we are talking about. In that strategy you will see that kind of lines of defense when you're talking about prevention. First, are the restrictions or cancellation of certain pesticides. That is clearly the first line of defense. If you've got a pesticide with a high leaching ingredient, then you look at where that pesticide's going to be used. You've got a good bit of flexibility to restrict its use.

One of the things we're trying to tie into that strategy is, how can States—because you've got such differences both in terms of what pesticides are used as well as the ground water and the soil conditions—how can States, even in components of States, further restrict uses of certain pesticides because of the ground water? How do we marry up a Federal regulatory program for pesticides, which I think is required, with a State and local knowledge of ground water conditions? That strategy tries to lay that out. So restriction and cancellation is a component of the first line.

The second line of defense is a monitoring effort. So that if you detect pesticides in an area at certain levels—and those levels are very low, much lower than a drinking water standard—you then could stop use of a pesticide in an area.

And finally, if you have contamination, what do we do as far as cleaning it up? Well, let's get out and start cleaning it up based on my differential protection classification program but using a drinking water standard as the basic takeoff point. But the key, as I was telling Senator Baucus, is that we have to focus a good bit more on whether it's pesticides, or whether it's other things.

On the prevention side, you've got the flexibility with risk-balancing to make those kind of decisions.

Senator DURENBERGER. If I may, just one other question. It relates to this: one of the issues that always comes up—because we're debating where EPA is and some of the rest of us might be—is this notion of the classification scheme on ground water, the first section and the third section you are dealing with. I wonder if you could help me understand that from the perspective of the owner of some surface rights, for example, somebody who is a gasoline or service station owner who has to put in new tanks. And putting one over a class I versus a class II, what does that mean? Or if I'm a dump site over a class III, for example, does it mean that I can do as I please and no corrective action's ever going to be required? How does the classification scheme relate to these uses?

Mr. THOMAS. The concept of classification is one that's been embodied in both our approach in the agency and also in most of the State approaches that have gone forward. What it carries with it is a variety of things both in terms of prevention and cleanup. For instance, the examples you gave. It could mean—in a class I area, which is a sole-source aquifer area—that you wouldn't locate a hazardous waste facility in that class I area. So in other words, you could restrict—now when I say you could, you could either do that through Federal location standards or you could do that through State restrictions. We see States that are doing that. We see States that have taken classification and used that as it related to tanks, as another example.

So it also means that in a class III area—which is an area where you've got contaminated ground water, maybe very contaminated ground water—you could have less stringent standards for corrective action. As an example, if you had contamination you could have a standard that did not require you to clean it up to a drinking water level because it would never be drinking water because it was already so contaminated. So I can see that as far as surface rights are concerned you could restrict those, or modify them based on what kind of ground water you had underneath, what the use or potential use of that ground water was. If you look through the State programs that's the kind of approach they take. They basically look at how they classify their ground water, and they restrict land use accordingly.

Senator DURENBERGER. Thank you.

Senator MOYNIHAN. Could I just make the point that Senator Durenberger introduced—and I think very usefully in terms of the Ogollala Aquifer—that when we talk about ground water we have at least two components. One is the clean water component, and the other is the adequacy component.

We've doubled our daily use of ground water since 1950, and the question of its adequacy begins to arise. In some parts of the country water is geologic and we are, in effect, mining it. In other parts, like the Ogollala, we are taking it out faster than you can put it back. Then you begin to get a resource question as well as a quality question.

Mr. **Thomas**. I think that you're right. They interact with each other, the quantity and quality issues, but that is also why you run into such vigorous debate on this issue.

I was in a community a while back where they were very concerned about salt water intrusion into their drinking water. They felt the reason they had salt water intrusion—it was a coastal community—was because another community down aquifer from them was pumping out so much of the aquifer that salt water was moving in. Well then, the quality and the quantity issue were all interrelated. Conservation is an issue when you talk about water quantity, and it becomes an issue when you talk about quality.

Senator **Moynihan**. I can just report, if any might be interested to know, that in Nassau County which is the biggest county right next to the city of Long Island, they are beginning to talk about desalinization plants. Which should stun you. I mean, the Saudi Arabians can talk about desalinization, but we can't, or ought not to be.

Senator Mitchell?

OPENING STATEMENT OF HON. GEORGE J. MITCHELL, U.S. SENATOR FROM THE STATE OF MAINE

Senator **Mitchell**. Thank you, Mr. Chairman.

I have an opening statement.

Senator **Moynihan**. We'll place it in the record at this point.

[Senator Mitchell's statement follows:]

Opening Statement of Hon. George J. Mitchell, U.S. Senator From the State of Maine

Protection of ground water quality is an important and longstanding interest of the Environment and Public Works Committee.

We have made some progress in this effort. The recent enactment of amendments to the Resource Conservation and Recovery Act, the Safe Drinking Water Act, the Clean Water Act, and the Superfund statute has expanded and stengthened programs addressing key sources of ground water contamination.

Over the past several years, Senator Durenberger has held a series of hearings on ground water issues. These hearings gave all of us on the Committee a better understanding of the seriousness and extent of ground water contamination and helped bring into focus the various steps we might take to address the problem.

I want to thank you, Senator Durenberger, for your long commitment to bringing the ground water contamination problem to the attention of the public and the Congress and for your continuing efforts to develop a legislative response to the ground water pollution problem.

In July of this year, I held a hearing on ground water contamination problems in my home State of Maine. Ground water is a vital and irreplaceable source of drinking water for a large part of the population of Maine. And, there is growing concern throughout the State that the quality of the resource is threatened by a wide range of contamination sources.

Witnesses at the hearing described the progress the State has made in addressing ground water contamination problems, but concluded that the problems are far from solved. A common theme of testimony at the hearing was the need for a partnership of Federal, State and local governments able to work together to address a comprehensive set of contamination sources and to prevent ground water contamination.

I am concerned that, despite our success in strengthening the ground water provisions of several existing statutes, we still have not established a comprehensive framework for protection of ground water resources.

Congress needs to provide a clear statement of policy on protection of ground water quality. We need to build a first rate program of ground water research. We need to better understand the health effects of the many contaminants in ground water. We need to improve ground water monitoring and assessment. We need to identify and implement the best methods of preventing and controlling ground water contamination from many different sources. And, we need to provide States and local governments with the technical and financial assistance they need to respond fully and effectively to ground water pollution problems.

These hearings will be an opportunity too for us to hear differing perspectives on how best to address these issues and to formulate legislation to protect the quality of ground water now and for future generations.

I want to thank Senators Moynihan and Baucus for organizing these important hearings. I look forward to working with you and other members of the Committee as we address this important issue.

Thank you.

Senator MITCHELL. I commend you, Mr. Chairman, and Senator Baucus for holding this hearing. I also commend Senator Durenberger for the leadership he's demonstrated in this area for many years. It is an important issue.

Mr. Thomas, in your opening remarks—the concluding portion of which I heard—you said that you were for Federal legislation. Yes and no is the way you put it. I'd like, if I could in a few questions, to try to define that a little more precisely.

I gathered from your remarks that you support Federal legislation but you would limit it to supporting State programs and providing research and other forms of technical assistance, at least those are the areas that you emphasized in your comments. I don't mean to make that all-inclusive of what you support or would oppose. That's what I want to pin down with the specific questions.

One of the questions is, what the goals of such legislation would be. As you know, in other major resource protection statutes we've set very high goals. The Clean Water Act contains a goal of zero discharges. I wanted to ask about the policy of differential protection to which you referred. It could be interpreted to mean that if an area's polluted let's not worry about it, and it might not deal with problems of degradations. So if I could ask you, would you oppose legislation that contained a specific goal of nondegradation of existing ground water resources?

Mr. THOMAS. Yes, I would.

Senator MITCHELL. You would oppose that.

Mr. THOMAS. As a matter of fact, I had a discussion with Senator Durenberger about it in the past, I think in another hearing. I think the nondegradation goal has the potential of being a totally unworkable kind of goal when you try to incorporate that into reality. So much of what we do on this planet has the potential, in some sense, of having an impact on ground water.

So if you say our goal is not to degrade ground water at all no matter where the ground water is, what its condition is, then in fact, in many cases you just have to say well, we're just going to stop. We're going to stop farming. We're going to stop having any septic tanks, and a number of things. So, I don't see it as something that is possible. That's why I've suggested that instead of that nondegradation goal we take into account the condition of ground water, and we take into account its use and potential use. We have a differential protection goal.

Overall, our goal is clearly to prevent contamination, to provide the States the capability to make decisions on prevention, to provide the States the capability and have an overall goal to cleanup ground water. But I don't think we can take something like a nondegradation goal and expect it to be implemented.

Senator **Mitchell**. Of course you recognize all policies have advantages and disadvantages.

Mr. **Thomas**. That's right.

Senator **Mitchell**. You've identified the disadvantages of the nondegradation goal. You also recognize, I'm sure, that the policy of differential protection, to the extent that it tolerated degradation, would in fact be condoning such degradation. So it seems ironic that legislation to protect natural resources would have the perverse effect of resulting in the further contamination of such valuable natural resources beyond that which exists at the time of the enactment of the legislation.

Mr. **Thomas**. I understand, Senator, and it is a dilemma, I think, as presented by you. My concern is that the nondegradation goal issue has become kind of a rallying point for an awful lot of people. Maybe I'm just too pragmatic and practical. I just see it as unrealistic and unworkable, and we're setting up a goal that we start off recognizing can't be met.

Senator **Mitchell**. You have fairly identified some of the problems with it. I think you would acknowledge that there are real problems with the policy of differential protection, as you've expressed it. I invite you to give some thought to and work with the committee—because as you know, members of this committee have great respect for you and have worked closely with you in the past—to see if there's some way of devising a policy that has more of the advantages of both and less of the disadvantages. I think we'd have a hard time supporting a policy of differential protection.

Mr. **Thomas**. Yes, I'll be more than happy to work with the committee on that issue.

Senator **Mitchell**. On this question of State roles, what do we do if a State doesn't take up the challenge? Do you have any suggestions as to how we—let's assume we proceed in the manner you suggested, which actually was the thrust of the legislation I introduced in the previous Congress. The question kept being raised to me, well, you say the States will do it. What if some States don't do it? We're really intending to protect a national resource, much of which is interstate in nature, to the extent we have knowledge of it. What do we do then?

Mr. **Thomas**. Well, that's certainly a fair question. I just don't think a negative approach to a State—held out in legislation that we're going to withhold money, we're going to withhold Superfund money—is going to do much. As a matter of fact, it may thwart what I see as a good bit of momentum on the part of the States now, and we're working with all of them on the ground water. As I indicated, we've got strategies out of 38 and the others are developing them. The States are interested in and committed to the issue of ground water protection. Now clearly, it's to one degree or another as you look across those States. But I think what's needed is a pro-active program of assistance, and that means some financial assistance. We've put some money out, and we'll continue to put money out.

I think a pro-active program of technical assistance in the form of information, in the form of technology, in the form of research findings, in the form of helping with Federal efforts like the USGS effort and others are what's needed. The States will move forward and deal with this issue. But in areas like hazardous waste or Superfund or pesticides, we clearly have established a Federal responsibility, because we've identified those areas as issues that are of national concern as far as contamination is concerned. We have decided that there are certain sanctions that if a State doesn't move forward to deal with the contamination issues associated with those then we will take certain actions, whether it is taking away the authority and running it as a Federal program or what. So I think that in those areas we've identified—and I think we've identified them now in our statutes, we've got them in a number of different statutes—you have a very strong hammer, if you will.

I was participating in a forum a year or so ago. The Conservation Foundation had a series of recommendations on groundwater. They included in there a number of what I consider to be sanctions, as far as States are concerned, if States don't move forward. I told them then that I was afraid that they would have more of a negative reaction, as far as the States were concerned, than a positive one. I saw the States moving forward, wanting additional help, wanting additional guidance. We were trying to provide it. To hold out a negative that we're going to now whap them in the head I didn't think was going to get us anywhere.

Senator MITCHELL. If I may have one more question, Mr. Chairman.

Senator MOYNIHAN. Sure.

Senator MITCHELL. There has been some prior discussion about standards and I'd like to refine that somewhat. As you know, we have used contaminant standards in other environmental laws. Do you believe that ground water quality standards should be established? And if so, should they be by the Federal Government or by the States? And if by both, do you believe States should be empowered to adopt standards more strict than Federal?

Mr. THOMAS. I think that question is probably at the heart of what a great amount of the debate is on groundwater. You clearly have to define standards before you can answer some other things. For instance, are we talking about some kind of ambient level for all toxic chemicals as a standard in ground water? If that's the case I've got some real concerns with trying to do that. Are we talking about technology standards, as it relates to prevention, when we talk about underground storage tanks? Clearly, we do need to do that. So as far as standard setting is concerned, I think standard setting is a part of ground water protection; whether it is technology standards for an underground storage tank program, whether it is a drinking water standard for drinking water purposes to ensure that ground water meets certain standards for drinking water purposes.

But to think that we are somehow going to set an ambient standard down in the ground, I've got real concerns about our ability to do it technically, whether it would be meaningful given how ground water moves, what we know about, and how we'd ever monitor it.

As to whether the Federal or State government should set the kind of standards I talked about—technology standards, drinking water standards, cleanup standards, it's a combination of the two. In those programs that we manage as Federal programs, clearly, we're going to be involved in setting those standards. In a number of cases, I think the States have to have the authority to be more stringent if they want to.

The one exception that I have a problem with—or at least one—is in the Superfund area, as far as a cleanup standard is concerned. As you recall, we had a great debate on that. We reauthorized that statute giving the States certain procedural rights to go through and challenge the cleanup standard that we set at a Federal level. I think that was the way to deal with that issue. That's a unique issue, to a certain extent. But in, for instance, RCRA, we set a standard. The State can be more stringent than a Federal standard if they go forward to do it.

We're trying to work out in our pesticide strategy how we would deal with it as far as pesticides are concerned. That's also a tough issue because of the need to have a Federal program and a centralized program for registration and reregistration purposes. But at the same time, recognize State responsibilities and authorities to be more stringent and particularly because the differences within States of that ground water, the kind of quality, quantity, and land use decisions that have to be made. You have to recognize a good bit of the State responsibility throughout this whole process.

Senator MITCHELL. May I take it that your response is that you do not favor ground water contaminant standards?

Mr. THOMAS. In the sense of trying to set a Federal ambient standard for ground water, yes, I do not favor that.

Senator MITCHELL. May I take it then that you also oppose States setting contaminant standards?

Mr. THOMAS. In that ambient sense, if a State wants to try and go forward and do that, I don't oppose it. As far as that being a standard that would be less stringent than a Federal standard, I do oppose it. And in the sense I have talked about Superfund and pesticides, I qualify it with those comments.

Senator MITCHELL. Thank you, Mr. Chairman. Thank you, Mr. Thomas.

Senator MOYNIHAN. That was a very useful exchange. I think Senator Mitchell was great. There are 41 States that now have standards, is that not the case? So it's not a new proposition.

OPENING STATEMENT OF HON. ROBERT T. STAFFORD, U.S. SENATOR FROM THE STATE OF VERMONT

Senator STAFFORD. Mr. Chairman, thank you very much.

I'm grateful and pleased that you and Senator Baucus are holding these joint subcommittee hearings. I do have a brief opening statement with respect to this hearing this morning, and I would ask unanimous consent that it be made a part of the record.

Senator MOYNIHAN. Without objection.

[Senator Stafford's statement follows:]

OPENING STATEMENT OF HON. ROBERT T. STAFFORD, U.S. SENATOR FROM THE STATE OF VERMONT

Mr. Chairman, I'll take just a moment. This is an important hearing because it signals our intention to protect the ground waters of the United States.

Our ground waters are still by and large pure and uncontaminated. There is still time to protect them from the fate which befell the air and surface waters of the United States.

The Nation acted too late to protect those resources.

When the Congress finally passed laws, it made the mistake of relying on an approach which allowed acceptable levels of pollution. In later laws, those mistakes were corrected, but it was too late to prevent some of the consequences.

One of those consequences is acid rain—the result of tall stacks that created what some believed were acceptable levels of pollution.

Another of those consequences was the poisoning of lakes, rivers, soils and even people by toxic chemicals—acceptable because scientists were unable to define what level of contamination was safe and what wasn't.

Today we have a chance to learn from both of those mistakes.

First, we can act to protect ground water while it is still pure and while there is still time.

Second, we can prevent another acid rain and another Superfund by establishing, as law, the one level of contamination which we all know will be safe: namely, zero.

That will be this Senator's objective during the coming debate and I hope others will agree.

Senator **STAFFORD**. I thank you.

Senator **MOYNIHAN**. I thank you. Senator Graham.

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Senator **GRAHAM**. Mr. Chairman, I also have a brief opening statement that I would like to submit.

Senator **MOYNIHAN**. Of course. Without objection.

[Senator Graham's statement follows:]

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Chairman Moynihan, Chairman Baucus, I commend you for holding this hearing today to hear testimony on ground water legislation before our committee. Ground water is a precious resource which we are just now beginning to appreciate fully. We are becoming increasingly aware of just how precious it is, given significant occurrences of contamination and consequent dwindling availability of this supply.

Taking our surface waters as an example, we can look to the recent Ashland spill and now the additional contamination of the Ohio from releases of toxic chemicals into the river. The immediate effect is a jeopardy of the drinking water supply. First, these events point out the need to be able to rely on long-term alternative water supplies, such as ground water. Second, much of our ground water resources are recharged from surface waters. The obvious result in the case of the Ohio River is ground water contamination from the surface water contamination.

It is time we looked at protection of ground water in a comprehensive fashion. We in Florida are very proud of our program, one of the first State programs of its kind. We have in place a ground water classification system, permitting program, monitoring program, wellhead protection program, well-plugging program, underground injection program, and a spill prevention and emergency response program. All of these efforts are coordinated and are working very well.

They must, because over 90 percent of all Floridians rely on ground water as their drinking supply. Additionally, our State has a very high water table, increasing the vulnerability to contamination.

Each State has varied characteristics, posing different risks and different needs relative to ground water protection. However, I think it appropriate to have guidance offered from the Federal level, offering a consistent menu of options to employ in addressing strategies. Each State must determine its needs, specific to its hydrogeological characteristics, and choose the most appropriate path.

I look forward to hearing from the witnesses today and thank both of you for affording me this opportunity.

Senator **Moynihan**. Did you wish to raise questions?

Senator **Graham**. No questions.

Senator **Moynihan**. Senator Pressler.

OPENING STATEMENT OF HON. LARRY PRESSLER, U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Senator **Pressler**. Mr. Chairman, I wish to become a cosponsor of Senator Burdick's bill, that's 1105, and I will speak to him about it. I do have an opening statement for the record.

Senator **Moynihan**. Happy to do that.

[Senator Pressler's statement follows:]

Opening Statement of Hon. Larry Pressler, U.S. Senator From the State of South Dakota

Mr. Chairman, I commend you for scheduling this hearing on ground water. Ground water contamination is a serious problem which we need to address.

In my home State of South Dakota, there is a rapidly growing concern about ground water contamination. A recent survey of 562 wells in Eastern South Dakota found 30 percent of the wells to have nitrate contamination. Since most rural residents and communities depend on ground water as a source of drinking water this trend is very troubling.

Agricultural practices are often seen as the cause of these problems. Farmers and ranchers are as concerned about ground quality as anyone. These people have to drink this water. Farmers and ranchers want to know how they can better manage their operations to reduce any threats to the ground water. They want more research and information, not burdensome Federal regulations. The extension service and other information sources need to be used to make farmers aware of the potential problem and teach them how to address the problem.

Ground water problems are different in each State and county. To effectively assist State and local governments in dealing with ground water problems any legislation must be flexible. The Federal Government can help with research and coordination of research.

The House of Representatives has passed a ground water research bill. The bill does not go as far as many people would like but it was passed. I would hope that this committee will take a similar approach this year. Time is running out on this session, we do not have time to move a far reaching ground water protection bill through the Senate and a conference committee.

Mr. Chairman, thank you for scheduling this hearing and I look forward to working with the other members on this important issue.

Senator **Moynihan**. Senator Symms.

OPENING STATEMENT OF HON. STEVE SYMMS, U.S. SENATOR FROM THE STATE OF IDAHO

Senator **Symms**. Thank you, Mr. Chairman.

I just have a very brief comment I want to make. I am glad we've begun to take a look at this question. It's probably one of the most important environmental questions facing the country.

I appreciate very much, Mr. Administrator Thomas, your statement. I have had an opportunity to look through it and I generally agree with the thrust of what you're laying out for us. We do have a lot of work to do in this area, and a lot of research that needs to be done. I think it's an area where all of us recognizes that there is a potential for a serious problem throughout the country. So I see a lengthy process here.

I don't know how soon it will be before we'll pass legislation, or what the chairman's intention is. But I do think that we need to be gathering up the data and the information and what technology we have and match those things up so we can see if there's problems in some parts of the country and if action can be taken.

I know in my State they're going ahead full-steam at the State level now. They're very concerned that we might pass something that would interfere with that process. So I want to study it very carefully and work with you, Mr. Chairman, and the other members of the committee to see what we can come up with.

Senator **Moynihan**. Thank you, Senator.

I have two questions I'd like to put to Mr. Thomas. And again, in the way you've been helping us with your thoughts and your experience in this situation, which is a permanent condition, but an exasperated one at this point of a resource shortage—I mean that the funds available to you are less than they might otherwise be. What would you say was the best investment that the Federal Government could make in order to increase State capacity to deal with this issue, the quality and quantity of ground water resources?

Mr. **Thomas**. Senator, first on the resource issue. I think when you look at Federal legislation you need to look at two sides of the resource issue, probably the bigger side is what implications that legislation has for State and local government. Have you really thought through the economic impact of what you're requiring State and local government to do?

The second side of it is, have you looked at the Federal resources that may necessarily be needed to implement that? Your question really gets at the Federal resources necessary to implement that.

From our point of view, I'd say the technical assistance and capacity building at a State level—and that can be done with some dollars, but I think it also can be done with technology, both technology that we develop through research programs, technology and technical assistance that are provided directly with Federal experts. So I'd say, as far as dollars are concerned, the kind of approach of a research approach and a technical assistance approach for the Federal Government to build and enhance the capability at a State and local level is the direction we ought to go as a first priority.

The concern I've gotten when I mentioned something, like in S. 1105 for instance, in addition to a research program it basically is a regulatory program. I mean you set up a big, big, big new regulatory program for requiring everybody who manufactures or imports any kind of chemicals that have gotten into groundwater anywhere to report to EPA. For EPA to go forward with a health assessment process is a massive kind of program.

My concern is, one, I've got some of those kind of things already and some of those authorities already. My concern is that if you put something like that in the law—like you've got to do this in six months and in six months have to do that—all of my resources then get devoted to trying to do that piece of the law, as opposed to trying to work with people down at a State and local level to build their capability to deal with this real problem.

Senator **Moynihan**. Senator Baucus, would you like to add some further comments or questions?

Senator **Baucus**. Thank you, Mr. Chairman.

A question. You said there should not be any negative Federal sanctions—the States, if they don't do something by a certain date.

Does that mean that we should repeal those provisions in the Clean Air Act?

Mr. **Thomas**. No. As a matter of fact, I think that as I indicated in a number of statutes where we have identified—let me come back to the Clean Air Act. That's an interesting question.

But on ground water where we've identified responsibilities under RCRA and underground storage tanks, we've identified that as a national focus. We've got negative aspects to it if States don't move forward, primarily that the Federal Government will take action. I think those things are appropriate and should continue.

The sanctions under the Clean Air Act is an interesting issue. I would like to see us use the sanctions under the Clean Air Act. I have been prohibited from doing that for the next several months while Congress moves through and decides what they want to do on reauthorization of the Clean Air Act. I would like to see those sanctions more realistic than currently exist in the clean air statute. I'd like to see us revise those. I've made some suggestions to Congress as to how they should be revised. Because what happens oftentimes—and it's not just the Clean Air Act—is that we talk about sanctions, but in fact, when we get down into what they really are they just become a bureaucratic nightmare.

Senator **Baucus**. Yes, I understand. Does that mean that we should have realistic sanctions for ground water legislation?

Mr. **Thomas**. In some programs, yes. I think where we've identified as a national——

Senator **Baucus**. It's more a question of—it's not so much an issue of sanctions, yes or no, per se——

Mr. **Thomas**. That's correct.

Senator **Baucus** [continuing]. Rather, it's where they're realistic.

Mr. **Thomas**. That's correct.

Senator **Baucus**. Thank you.

Senator **Moynihan**. Senator Durenberger.

Senator **Durenberger**. No further questions.

Senator **Moynihan**. Well once again, Mr. Thomas, we want to express the appreciation of this committee for your appearance, for your concerns and for your candor with us. It wouldn't be hard to say, great, give me another program. I'd love one. We'll be back at you. We're in this process. Senator Symms says we're thinking about legislation this year, but we won't be there until we've been back to you many times.

And thank you, Mr. Jensen, for coming.

Mr. **Thomas**. Thank you, Senator.

Senator **Moynihan**. The first of two panels that we're going to hear from this morning and this is very much a State-based exercise. I'll ask our witnesses to come forward if they will. Mr. Harold Reheis who will be speaking on behalf of the Association of State and Interstate Water Pollution Control——

Oh, wait! Stop! Stop everything! Hold it, we've left out the Department of the Interior. Oh, terrible.

Mr. Secretary Ziglar, would you come forward, sir. Mr. James W. Ziglar is the Assistant Secretary for Water and Science in the Department of the Interior. You're accompanied, Mr. Secretary, by——

Mr. ZIGLAR. By Phil Cohen, who is the Chief Hydrologist at the United States Geological Survey.

Senator MOYNIHAN. Good morning, Mr. Cohen. We welcome you, doctor.

How did that combination, water and science, get together? It sounded like they merged the two.

Mr. ZIGLAR. Well Mr. Chairman, if you believe the U.S. Geological Survey's version of the history, the fact of the matter is that the Bureau of Reclamation and the Bureau of Mines, at one time, were part of the U.S. Geological Survey. Back around the turn of the century, I suppose, the Bureau of Mines and Reclamation were split off from Geological Survey, and consequently there is a historical relationship. That historical relationship was broken up at one time. Just a few years ago the Bureau of Mines, Bureau of Reclamation, and U.S. Geological Survey were put under one Assistant Secretary, which happens to be called Water and Science. So, that's the history of it.

Senator MOYNIHAN. Perfectly clear, Mr. Ziglar.

Mr. ZIGLAR. I thought so too.

STATEMENT OF HON. JAMES W. ZIGLAR, ASSISTANT SECRETARY FOR WATER AND SCIENCE, DEPARTMENT OF THE INTERIOR, ACCOMPANIED BY PHILIP COHEN, CHIEF HYDROLOGIST, U.S. GEOLOGICAL SURVEY

Mr. ZIGLAR. Well, I was really enjoying the hearing, Mr. Chairman, and had I had to wait out the other panelists, that would have been okay, too. But Mr. Chairman, Senator Baucus, and other members, it's a great pleasure for me to be here.

This is my first opportunity to appear before this committee. It's on a subject that is of great interest to me and something that, in my rather short time in office, I have devoted a considerable amount of time to, and that is ground water and the problems that we face in this country with our ground water resources.

I've submitted testimony already.

Senator MOYNIHAN. It will be included in the record.

Mr. ZIGLAR. Great.

I'd like to just make a few short remarks. My first remark is that it's very difficult to follow my friend Lee Thomas because he has 5 years of experience. He's a very articulate spokesman in this area and, quite frankly, it's very difficult to follow someone who you fundamentally are in agreement with. Lee and I have spent a lot of time together looking at this issue, and I think that we generally feel the same way on most of these issues. So a lot of the things that I was going to say I will shorten because it would be like a broken record.

Since I took office, I've become increasingly convinced that the Nation really does need to strive to manage its water resources in a way that strikes a balance among the concerns for environmental protection, health, and of course our economy. In my view, we need policies that provide flexibility recognizing the differences in the use, the value, and the vulnerability of different water resources.

One of the most difficult problems that we face is allocating our scarce public and private resources to deal effectively with the most serious problems, rather than striving to achieve zero-risk everywhere. This is a difficult task, and in my view—and certainly my view is from a basic scientific view, not a regulatory point of view—what we really need is basic research and information to help us achieve that balance that I think we probably all seek.

I've had the opportunity to be an active participant in the Interagency Taskforce on Groundwater. Our report, which was just sent to the Hill yesterday, entitled a "Description of Major Federal Scientific and Technical Groundwater Programs for Fiscal Year 1987," shows that the Federal Government already has a rather large and active program of research situated in several different agencies. In fact, you will find from this report that in fiscal year 1987 there was approximately $215 million spent on ground water research governmentwide.

Senator MOYNIHAN. That's about what Mr. Thomas said. He said about $200 million.

Mr. ZIGLAR. Well, Lee participated also in this so he got his figures from the same place, and $110 million of that $215 million can be found in the programs of the U.S. Geological Survey. Of that $110 million, approximately $20 million was actually contributed by State and local governments to support our research efforts on ground water.

The information that we developed through this task force has really strengthened my belief that additional legislative authority is not needed at this time for the various agencies to carry out the necessary ground water-related research, technology development, technical assistance, and information dissemination. Now I will grant you that we probably need a little better coordination of those programs to make sure that, while we may have some overlap, we don't have too much undesirable overlap. Quite frankly, we are taking some measures at this very point in time to better coordinate in the Federal Government.

The Committee on Earth Sciences of the Federal Coordinating Council on Science, Engineering and Technology—which is a adjunct of the White House—has created a subcommittee on ground water. And that subcommittee is being chaired by Dr. Robert Corell, Assistant Director of the National Science Foundation. The purpose of that subcommittee, which was formed in December, is to coordinate the research activities among the Federal agencies so that we get a better focus on ground water research. We think that's an important step that we're taking to better coordinate those programs that we already have in existence.

I'm pleased personally with the contribution that the USGS is making to the understanding of our Nation's ground water resources. We have the Regional Aquifer System Program. We have the National Water Quality Assessment Pilot Program. We have the Toxics Hydrology Program. We manage the Water Resource Research Institutes, and there are 54 of those throughout the country.

Finally, and maybe in many ways the most important, there is the Federal-State Cooperative Program which we've had with the States for over 100 years now where we provide research assistance to the State and local agencies and the kind of information they need to manage their local water resources.

I would say that this is a highly unusual program in the annals of Federal Government history because we have 950 State and local agencies that actually provide funds to the Federal Government rather than the other way around. In fact, in the current year these State and local agencies are providing $55 million to the U.S. Geological Survey for our water-related programs. This is the kind of true Federal-State partnership that I believe we ought to be supporting.

I'd like to also point out that in this period of nearly level budgets for the USGS—over say the past 5 years—that we have redirected our programs—away from the quantity side of water and more to the quality side. In fact, we have redirected some $20 million to $30 million over the past 5 years into quality, issues and out of the quantity issues because we believe that that's really where the major thrust ought to be in our programs. That is something that I've taken a great interest in since getting to this office not too long ago, and we are stepping up our efforts in that area.

My written testimony reflects some principles that I think ought to guide the Federal Government in looking at the ground water problem. One of the things that's not in there, but that I would like to say, is that I happen to agree with my friend, Lee Thomas, that we ought to have a statement of a national goal of ground water protection, cleanup, and that it is a valuable resource. I think it would be helpful to have a statement of a national goal.

I also think, like Lee, that the primacy of State and local governments in managing ground water resources needs to continue to be recognized. If you look at the way that most State and local governments are managing their ground water resources today, you will find that it's quite often tied to land-use control. Of course, that has always been a State and local government responsibility.

The Federal mission should be, in my view, to protect human health and the environment by carrying out the statutes that we have already and by research, conducting resource assessments, and technical assistance to the States through information and research programs. I believe that the appropriate way to carry out these programs is in a Federal-State partnership arrangement with joint funding, in voluntary associations and configurations like the Federal-State Cooperative Program that we have at USGS.

I also believe that in any legislation that happens to be passed—if you were to pass it—we need to avoid competing technical assistance programs among the different agencies and different cost-sharing formulas. Quite frankly, we have found that the 50-50 cost-sharing formula for our Federal-State Cooperative Program has been very effective and has been just the right balance to induce the States to participate with us. I think that if you had different cost-sharing formulas among these programs, what you would have, in effect, is forum shopping by the States for the best funding level for programs that do the same thing.

I also believe that we should not have in any legislation—should it pass—a lead agency designation because we have so many different types of programs with different emphasis and different viewpoints. Our viewpoint at looking at these problems is very different than Lee Thomas' because we are a basic science organization; we're not a regulatory agency. I think a lead; agency designation would be harmful. Rather, I think that having the President coordinate it through an organization like the FCCSET subcommittee on ground water is an excellent way of coordinating that program.

Senator MOYNIHAN. When you say the President, you typically mean OMB. I mean that's the reality. The President doesn't know that committee exists. No President ever will.

Mr. ZIGLAR. Well, actually, it's the Science and Technology office in the White House that really has the control.

Senator MOYNIHAN. It's not in the White House. It's in the EOB.

Mr. ZIGLAR. The EOB.

Senator MOYNIHAN. Correct.

Mr. ZIGLAR. Well those of us downtown look over there and we see that big compound and it all looks like the White House to us. So when I say White House, I agree with you, Senator.

Really, from a parochial point of view, I believe that the USGS, has played the leading role in science and information for the past 100 years. As we look to the future we should make every effort to make full use of the capabilities of the USGS which stands ready to do what's necessary in the research/information area.

In conclusion, Mr. Chairman, I'd like to put into the record three documents. First is a summary of the National Water Quality Assessment Program that we recently released, which is a pilot program as you know.[1]

Second is an evaluation of the State Water Resources Research Institutions, again, which we recently undertook. We find that they are working very well.[1]

And third is a copy of this description of Major Federal Scientific and Technical Groundwater Programs for fiscal year 1987, which we just sent to the Congress yesterday.[1]

Senator MOYNIHAN. What is—you just have to help me—it says here, "fate and transport," sounds ominous, like getting on the Eastern shuttle.

What's fate?

Mr. ZIGLAR. Mr. Chairman, I'm not a scientist, but the scientists have explained it to me that when a contaminant hits the ground, the contaminant, because of characteristics of the soil or because of a number of chemical interactions, may well change its character. It may be neutralized by the soil and become of no significance. It may not move in the soil, but it may move. One of the things that we need to know about contaminants—which we are studying, but for which we certainly don't have the answer—is, how do those contaminants react when they get into the soil? Do they move? How quickly do they move? Do they maintain their same character? Or do they take on another character? They may become more toxic, or they may become less toxic, but that's the kind of basic scientific research that we need to do and to have more knowledge about before we can come up, in my view, with a rational way of dealing with these contaminants when they do get into the soil.

Senator MOYNIHAN. What fate does it have?

Mr. ZIGLAR. It's what happens to it when it gets there. Does it keep its same character, or does it change its character? Does it continue to live, or does it die? I guess that is a way of describing it.

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[1] Retained in committee files.

Senator **Moynihan**. Well that's what fate usually is about, in general.

All right.

We thank you very much, Mr. Ziglar.

Now I'd like to ask our colleague, Senator Durenberger, if he would like to open the questioning.

Senator **Durenberger**. Yes. Thank you, Mr. Chairman.

Mr. Ziglar, let me ask you first—to quote verse from page 6 of your testimony which deals with nondegradation and ask you a couple of questions. The statement says,

> The consequence of a nondegradation policy would be a virtual halt of the use of agricultural chemicals, to many industrial activities and to the use of septic tanks for waste disposal. Our policy should be to focus our limited economic resources and technical resources on the most serious threats to people's health and to develop the knowledge of the resource and management methods that will result in even better management of groundwater quality in the future.

My two questions are these: first, I would ask you to compare the nondegradation goal that people are suggesting—and I take it that you are responding to—the nondegradation goal for a ground water program with the goal which currently exists in the Clean Water Act, and especially tell us the degree to which that goal in the Clean Water Act has led to the virtual halt of industrial activity in America?

Mr. **Ziglar**. Well, Mr. Senator, I think the intent of what we were saying there was that to impose a nondegradation standard in the absence of information about the fate and transport, if you will, of contaminats in order to comply with a nondegradation standard would be to require, at this point in time, virtual elimination, for example, of pesticides and that sort of thing, which would have without any question a serious impact on the agricultural industry. Or the mining industry——

Senator **Durenberger**. I know that's what you intended. I wanted to give you an opportunity to compare—to give us some point of reference for that statement by using the Clean Water Act and its goals and its impact on industrial activity. I'm trying to help you try to make your point.

Mr. **Ziglar**. Well, I can't claim to be an expert on the Clean Water Act. It's not something that I've dealt with in my area of jurisdiction. But as I understand it, the Clean Water Act is a health standard. That's correct, I believe. A health standard is not necessarily a nondegradation standard. Now for my understanding of it, it's not a complete nondegradation standard. I guess I'm searching, Senator, for where you're trying to lead me and I'm not real sure.

Senator **Durenberger**. I won't press you for an answer right now, maybe you can go back and provide that for the record.

Mr. **Ziglar**. Sure.

[The information requested follows:]

The Interior Department is not the Federal agency charged with implementing provisions of the Clean Water Act, although it certainly must comply with its requirements. The question of what have been the consequences of the Act and specifically what have been the consequences of its originally stated, but unrealized, goal of zero discharge of pollutants is a difficult one to answer, both from the standpoint of determining the water-quality consequences of the Act and from the standpoint of determining its economic impacts. Rather than speculate about the consequences of that law, I will confine my answer to my views of an appropriate goal for ground-water management.

I stand by the statement in my testimony: "The consequences of a nondegradation policy would be a virtual halt to the use of agricultural chemicals, to many industrial activities, and to the use of septic tanks for waste disposal. Our policy should be to focus our limited economic and technical resources on the most serious threats to people's health and to develop the knowledge of the resource and management methods that will result in even better management of ground-water quality in the future." I would also note that I fully endorse Lee Thomas' testimony on this subject: ". . . ground-water quality decisions should reflect the use, value and vulnerability of ground water. Since most land case at least some ground-water contamination, a nondegradation policy . . . would virtually eliminate many land use activities. Consequently, we strongly oppose a strict nondegradation policy for ground water."

My statement a consequences of a nondegradation policy take the words at face value. Nondegradation would mean prohibiting any chemicals from entering aquifers. It is my belief that such a policy would be technically impossible to achieve, and that striving to achieve it would be socially and economically undesirable. Rather, the Nation should seek a balance among concerns for health, the environment, and the economy as it makes decisions that affect ground-water quality. This balance has to consider the uncertainty about the fate, transport, and health effect of the contaminants in question and the fact that many decisions made today will have effects far into the future.

The goal I propose is based on a recognition that the choices that our Nation faces are difficult ones. We all recognize that we must set priorities, that we must protect some resources more than others, and that having a functioning society requires that some chemicals (both natural and man-made) continue to enter our ground water. The question is: do we acknowledge this when we state our goals? It is my view that such realities should be expressed right from the start and that legislation, if such were necessary, should aim at creating technically valid mechanisms.

Senator MOYNIHAN. But that's a large proposition from a respected and responsible member of the Executive Branch. I think we would like—what Senator Durenberger said—we would like to hear more of your thoughts on that.

Senator DURENBERGER. It is fairly clear that this issue of nondegradation is one of the differences in varying approaches to this whole issue. As a person who comes at this from a nondegradation view and who has some historic precedent, I think, in my favor, I can't just accept the notion that it's your opinion that we're going to stop industrial activity in ground water with a nondegradation standard unless you can prove it to me in some way. So, I'd like you to try to prove that. It sounds too much like an OMB statement and not enough like the United States Geologic Survey for which I have an incredible amount of respect. So if you can elaborate on that for the record it would be helpful.

Mr. ZIGLAR. Well, Senator, without having to draw any comparisons to the Clean Water Act, let me say that my view of it is really based on a more common sense, I guess for lack of a better term, view; that is, if you were to impose a standard that said that as of today nothing would be allowed to be put on the soil, for example, that might have some effect on the ground water in a particular area, or in any place in the country—particularly when you really didn't know what the fate of that contaminant was but you assumed that it kept its same character. If we were to impose a standard today, there would be a lot of things that could no longer be put on the soil in any particular place. That would have a severe, it seems to me, economic effect.

That's why I—in following on to the nondegradation idea—happen to agree with Lee Thomas. A differential protection approach makes a lot more sense because there are aquifers that will never be used for drinking water, are already contaminated. We have to differentiate those because there are human activities that will contaminate the ground water. What we have to do is protect that valuable resource that we have got for drinking water and for other human activities that require that standard. But we're not going to be able to have a nondegradation standard, realistically, in my view, from a complete national perspective. I can assure you that OMB did not force me to say that.

Senator DURENBERGER. Implied in the quotation I gave you is at least the possibility that you think pesticides and industrial pollution and septic tanks are not serious national threats to ground water. I wonder what you think the threat is currently. What is the single most important threat to ground water quality in America today?

Mr. ZIGLAR. Well, I hope I didn't imply that I didn't think that those were serious issues that need to be looked at. I think, frankly, the man-made organic and trace metals, those sorts of things are at present potentially one of the most serious—from a contaminant point of view—problems.

It's something that we are looking at in our National Water Quality assessment pilot program. We're looking at that in, I believe, seven different sites. We are having that program evaluated by the National Academy of Sciences. In the 1990's we will be back to—with our report—whether or not that program should become a nationwide program in terms of the assessment of a lot of things. This is a major element in our looking.

Again, I'm not a scientist, but from what I've been able to read it seems to me that those kinds of organic and trace metals and those kinds of things do present, potentially, a very serious situation for some of our drinking water resources, and we need to deal with that. We need to know what the real effect of those things is. I think if we' have the knowledge we can deal with the problem.

Senator DURENBERGER. One of the intergovernmental questions that I have—and you've been very good in my State as in others in these cooperative research programs. I think you indicated that there's about $20 million against your budget coming in from the States. But as I understand the way these programs work, they're half Federal money, half State money, but all Federal employees. As the States, like Minnesota and others, get more sophisticated on ground water problems, they're going to have their own geologists and hydrologists and so forth, and begin doing their own work. I would suspect that they're going to want your 50 percent support, and their employees, not the other way around.

Well, I think I already heard you say that you had some negative views about other agencies or getting involved here. But what is your view about how the States are going to look at all of this Federal agency involvement in the process? Aren't they going to want more of it? Aren't we going to be in a position where we're going to be funding State level research activities?

Mr. ZIGLAR. Well, let me respond to one remark you made because I certainly didn't want to leave the impression that I had a negative view of other Federal agencies being involved. In fact, I think it's quite healthy because if you have got a U.S. Department of Agriculture, an EPA, a Department of Energy, DOD, and any other agency each one focusing on the particular problems that they have in their arena and providing input into the total research picture, I think that's healthy. Like Lee said, a little duplication is not necessarily bad. I don't have a negative view of other Federal agencies. I do have a negative view, though, of the notion that the efforts made across the Government are not coordinated, and that we, in fact, have people doing the same thing.

I came out of the private sector where I was a manager, and I didn't particularly like excess overhead. I just sort of view it that way. I would like to think, Senator, that the U.S. Geological Survey and the other folks that are involved in this are going to do such a good job in providing training, technical assistance, information and help to the States that the States, in fact, will take this into their own responsibility areas and continue to develop their knowledge in their management and protection programs.

I believe that there's always going to be a role for an organization like the U.S. Geological Survey with its basic science approach because, quite frankly, there are certain types of research that I don't think any State, by itself, can possibly do within its budget because it's such a wide thing. It's a nationwide research program so that we study the characteristics in the hydro-geologic differences and draw comparisons. I think that there's always going to be a role for the U.S. Geological Survey. I think our role will expand with the respect to the States as the States get more involved in it and want to draw on that knowledge base that we've created and continue to create.

Senator **Durenberger**. Thank you.

Thank you, Mr. Chairman.

Senator **Moynihan**. Thank you, Mr. Durenberger.

I guess if we'll just follow our early-bird rule. Mr. Symms?

Senator **Symms**. Thank you very much, Mr. Chairman.

And thank you, Mr. Secretary, for your testimony.

I just want to quote something, and then ask one question in relation to what you said in your statement. You say,

> First and foremost, I believe the Federal Government must recognize that the primary responsibility for ground water protection and management lies with State and local governments. This is based both on philosophical and practical considerations. State and local governments always have held responsibility of managing their groundwater resources for residents of their communities. I do not believe the Federal Government should insert itself into that process beyond what the present statutes require. Even more basic to this concept, however, is the fact that many of the currently known means of protecting ground water involve land use controls, a role which belongs to State and local governments.

I happen to agree with that and I generally agree with what you've said thus far, and with what Mr. Thomas said preceding you. But in view of that position, what would you advise us on this committee, and the Congress in general, to do to help coordinate or to make ground water programs more secure for the future safe water supply for the country? What do you recommend we do?

Mr. **Ziglar**. I think what you're doing today is very helpful, and that is focusing attention on the issue. I think a continual focus on the issue, along with, quite frankly, a careful scrutiny of how well we're doing in the future in coordinating and setting our priorities in the research area and developing our assistance programs, if you will, to the States in helping them manage their ground water, is an important part of keeping the spotlight on it. I think, at the moment, it's not necessary to enact additional legislation because I think we do have the necessary authority for the research that we have going now. But I do think a look-see constantly at what we're doing is important to keep that focus on what we're doing.

Senator SYMMS. Thank you very much.

I mentioned earlier that in my State they've been very active in clean air and clean water for about 20 some years now. The general feeling that they have reflected in messages received in my office, is to be very careful about interfering with the process that they now have going on in the coordination that they have. But I think that it is an issue where we do need to compile all of the information, certainly, that's available, and maybe a clearing process, somehow, so that people do have access to what's available.

Mr. ZIGLAR. Senator, we at the U.S. Geological Survey have some 250 offices that provide just that kind of information. In fact, through the National Water Data Exchange we processed 87,000 requests last year for information on water resources. Our view is that one central clearinghouse is not a particularly good idea, just because of the access problem, rather than having it spread out.

Senator SYMMS. Well, I'd like to say your people do an excellent job in my State.

Mr. ZIGLAR. Thank you.

Senator SYMMS. They have worked a great deal with the Idaho Aquifer and compiled a lot of information about what has been put in the aquifer and how far it's moving. I think it's been very helpful. There's been a great deal of cooperation between the State of Idaho Water Resources Board and the U.S. Geological Survey and I think it's been helpful. We naturally are very concerned because of the largeness of the Idaho Aquifer and what it means to down stream water users and for drinking water also. But I thank you very much for your testimony.

Thank you, Mr. Chairman.

Senator MOYNIHAN. Thank you, Senator.

Senator Chafee.

Senator CHAFEE. Thank you, Mr. Chairman.

I know that the time's late so I'll make this a very quick question. Mr. Secretary, in your testimony you make the point that the skilled personnel to work with ground water problems are difficult to obtain. My question is, where do you get the people and what type of courses do they take in college or in graduate school and are we training more? Are they coming through the pipeline?

Mr. ZIGLAR. Senator, I'm afraid that the world of geology and hydrology——

Senator CHAFEE. Is geology the natural course for them to have taken?

Mr. ZIGLAR. And hydrology, which is related. I'm afraid that that world is probably suffering the same problems that the rest of the scientific community is suffering, and that is that we're not training as many scientists these days as we once did, and there seems to be a drain in that area. Getting them is more and more difficult because they're not coming through our system. We are trying to encourage that through the 54 Water Resource Research institutes that we have in the different States that are associated with universities. In order to be one of those research institutes, we require certain curriculum that they provide the students. We have had some success in those research institutes in developing an interest in this area. Hopefully the pendulum will swing and there will be a lot more interest through students coming up in the science area.

Senator CHAFEE. Well, I have known a group of youngsters that live near me who have been interested in geology. Just listening to their discussions, it seems to me their fortunes seem to rise and fall in what the oil companies are doing. I'm not sure that they understand—maybe they do—that it's adequately publicized that out there is a whole new, not other, exciting area—ground water. There's a need for these individuals and there are opportunities for them. I wonder if they know that; maybe they do. But the ones that I've talked to, the youngsters that I chat about at home, seem to constantly talk about geology in connection with the oil companies.

Mr. ZIGLAR. Well, unfortunately, most people when you talk about geology think about minerals for petroleum. I think that we probably could do a better job of telling young people that there is an opportunity here in not only a good profession, but something that would do a service to the Nation.

Senator CHAFEE. True. Thank you.

Thank you, Mr. Chairman.

Senator MOYNIHAN. Well, the problem, Senator Chafee, is that discovering water, as against discovering oil, has their differential rewards.

But on the other hand, this is the heroic age of geology as a science. The techtonic plates, those things we missed.

Mr. Cohen, it is a very rare privilege for us to have you before our committee. Could you comment further on what Senator Chafee was saying? I think we would all be interested; does the Geological Survey feel it has enough resources to work with problems of ground water in the terms that we've described, quantity and quality? Are you satisfied with what you were able to deploy?

Mr. COHEN. We have a very substantial workforce, Mr. Chairman. We have about 4,000 employees in the Geological Survey involved in our water programs. Approximately 50 percent are professionals, mainly hydrologists, geologists, and engineers. There's a great deal of interest in ground water hydrology, in large part stemming from the major pieces of legislation enacted by the Congress, multi-billion dollar industries associated with Superfund and RCRA. We find a very fascinating flux of some of our best middle-grade scientists out to the consulting community——

Senator MOYNIHAN. Oh, is that right?

Mr. COHEN [continuing]. Where they're able to double their salaries. Incidently, we've been working with the professional associations involved in petroleum geology. Petroleum geology is at a low point right now. Many of the disciplines that petroleum engineers and geologists have, with regard to the physics and chemistry of the flow of one fluid through an oil reservoir, are very analogous to the flow of water through aquifers. So these folks are moving into this field of geology pretty rapidly.

Senator MOYNIHAN. There is a lot of unemployment or underemployment with respect to the minerals, and an opportunity to focus on this question is one I think we probably should use. It's great science. My God, you know—figure out what you can't see, can't touch, can't do anything with it.

Senator Baucus.

Senator BAUCUS. No questions.

Senator MOYNIHAN. Mr. Secretary, we thank you for coming forward and would like to congratulate you in the work you've done with the Bureau of Reclamation.

Mr. ZIGLAR. Thank you, Senator.

Senator MOYNIHAN. When you go back to see all your Republican friends, remember that it was Theodore Roosevelt who started the Bureau of Reclamation, an enormous act of Federal intervention in the rights of State governments. And the consequence of it, we have all that lettuce that we eat every day at lunch while we denounce big bureaucracies.

Mr. ZIGLAR. Well Senator, being a native of Mississippi, I'd like to point out that Congressman Newlands, who actually carried the bill that created the Bureau of Reclamation, was in fact a native of Mississippi although he became a Congressman from Nevada.

Senator CHAFEE. He lost his home touches when he became a Congressman?

Senator MOYNIHAN. Thank you very much, Mr. Secretary.

Mr. ZIGLAR. Thank you, Mr. Chairman.

Senator MOYNIHAN. Thank you, Mr. Cohen.

We are having a very helpful, to us, morning of inquiry and exchange. But it's going past our expectations, and so I'm going to—with the kind agreement of Senator Baucus—we're going to have to postpone our second panel. All of the representatives are based here in Washington, and we will reschedule that hearing very shortly.

But now, we will go to our first panel which will have to conclude at 12:45.

So we welcome Mr. Harold Reheis, on behalf of the Association of State and Interstate Water Pollution Control Administrations. He is accompanied by Ms. Robbie Savage, who is Executive Director. Mr. Craig Bell, who is Executive Director of the Western States Water Council.

Mr. Bell, we welcome you. Mr. John Morris, who is Chairman of the Interstate Conference on Water Policy. Mr. Morris, you're over to the left, and you're accompanied by Ms. Joan Kovalic who is Executive Director of the Interstate Conference. And finally, Mr. Thomas J. Buchanan, who is appearing on behalf of the American Waterworks Association. Mr. Buchanan, good morning to you.

We'll follow our normal schedule and begin as listed in our program. Mr. Reheis, do I pronounce that correctly? And you can—any one who wishes can—put their statement in the record and summarize as they like. All statements will be put in the record as if read. And I'm going to take the—unless either of my associates would wish it otherwise—I thought we might hear each of our witnesses, and then address questions.

Sir, proceed.

Mr. **Reheis**. Mr. Senator, Ms. Savage is going to start for us.

STATEMENT OF ROBERTA SAVAGE, EXECUTIVE DIRECTOR, ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

Ms. **Savage**. My name is Robbi Savage. I am the executive director and the secretary/treasurer of the Association of State and Interstate Water Pollution Control Administrators [ASIWPCA]. As indicated, Mr. Reheis is the Assistant Director for the Georgia Department of Environmental Protection as well as the vice chairman of our association's ground water task force.

The ASIWPCA members are responsible for the implementation of State water programs. Our membership includes natural resource commissioners and heads of environmental protection agencies within the State which gives us an opportunity to look at policy as well as technical positions from a multi-media perspective.

As I indicated, Mr. Reheis is responsible for air, water, hazardous and solid waste, water quality and water quantity.

Mr. Chairman, we appreciate the opportunity to come before you to discuss ground water protection. We appreciate the opportunity to tell you right up front that we support S. 20, and we are very encouraged by the concepts outlined in the provisions, Mr. Moynihan, which you brought before the Congress. We look forward to working with you on this legislation.

States cannot, however, be supportive of the kind of prescriptive language that we've seen in other Federal statutes recently provided by the Congress, and let me tell you why. Such prescriptive language will most certainly duplicate in many instances the existing requirements of national statute, of which there are currently 13 major statutes——

Senator **Moynihan**. Would you excuse me, Ms. Savage. There's an undercurrent of conversation in the back and I'd like to hope we would show our witnesses the courtesy that others expect.

Ms. **Savage**. Thank you, sir.

As I indicated, there are currently 13 major statutes which deal with ground water protection. A prescriptive law on top of these prescribed ground water protection strategies would exacerbate a very significant management problem that the States currently face.

Let me tell you another feeling that the States have in looking very currently at the budget placed before us. Wellhead protection was mentioned, which a number of you worked very closely with the States to put forward, but that was not funded by the Congress in the appropriations process. Your nonpoint source language was authorized by the Congress but was not funded and the clean lakes programs also not funded. And, if you look at the Clean Water Act, which has been referenced several times today, what we see in the State grants area, specifically, is a 34 percent reduction in our State revolving-loan funds in waste water treatment and a 32 percent reduction in State grants to manage water quality programs.

So you can understand why we are very concerned about additional legislation that in all probability would not be funded.

As documented by your outstanding staff, Mr. Chairman, the States are on the cutting edge of the ground water protection program. I'm concerned to hear comments that would indicate that there's not a whole lot going on out there in ground water protection. This is not a new issue for the States, and there are outstanding programs currently in place.

In addition, our association has been working very closely with the States to sponsor technical exchange seminars to provide scientific and technical management opportunities for the States. Part of this effort is a recent survey of the States asking them about their ground water protection programs. I will refer to that survey as will Mr. Reheis during his statement.

The position of the association is that the States need to continue to be responsible for the ground water protection quality and quantity programs, that the States should define the degree and extent of ground water pollution and consider the effects of degradation on other State waters. States must develop and maintain comprehensive ground water quality programs and provide adequate financial support.

The ASIWPCA ground water survey, as I mentioned, indicates that 98 percent of the States use permits to control the discharges to ground water and 77 percent of the States have comprehensive ground water quality regulatory systems in place. The remaining 23 percent are in the process of developing those systems and will have them by the end of this year. All States are actively monitoring for ground water under the Safe Drinking Water Act requirements. Other, more expansive types of monitoring programs are being conducted by 70 percent of the States.

We've looked, Mr. Chairman, at the Federal role and the State role, and we have some specific views on what the various Government bodies could be doing.

The Federal Government should, as Lee Thomas indicated, provide technical assistance, support research and development, and disseminate information to the States. It is inconceivable for the 50 States to try and duplicate the kind of research information necessary to manage this progress. It makes a lot of sense for the research to take place here at the Federal level.

The Federal Government should assist the States in the definition of geologic and climatic conditions which control ground water quality and quantity.

The Federal Government should involve the States in activities and provide adequate financial support for State programs addressing interstate problems.

Mr. Reheis will continue.

STATEMENT OF HAROLD REHEIS ON BEHALF OF ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

Mr. **Reheis**. Existing Federal laws and regulations have not addressed ground water in a coordinated manner and have created numerous administrative and statutory inconsistencies. This is because the 13 major national statutes were written at different times and with diverse purposes. Because of this morass of Federal requirements, it is not surprising that 95 percent of the States polled agreed that Federal environmental laws related to ground water should be changed to achieve better coordination and consistency.

For a hypothetical example, imagine please three neighboring industries all producing a waste with heavy metals. Industry A discharges its sludge or wastewater into a holding lagoon that is actively used and covered under RCRA. Industry B used to discharge waste into a holding lagoon and no longer does. That lagoon is covered under Superfund. Industry C treats its waste in a lagoon and has a NPDES permit to discharge under the Clean Water Act.

All three lagoons are leaching heavy metals into the same aquifer at essentially the same rate, thus you would assume that consistent corrective action should be taken for all three. However, under current Federal laws and regulations, Industry A is required to cleanup its ground water contamination to the point that you can't find it anymore, to the point that it equals background or natural ground water quality. Industry B is required to do a cleanup that is determined to be "cost-effective." Industry C may have no specific requirements for cleanup.

These industries are creating essentially the same types and magnitudes of contamination, however, the requirements under existing Federal statutes are very different. This type of inconsistency retards the State's efforts to implement sensible, comprehensive, and effective ground water management programs.

To resolve these difficulties, ASIWPCA recommends that any Federal legislation encompass five major principles.

First, USEPA must quickly develop health-based criteria for a number of common or pervasive ground water contaminants. While this effort has already begun under the Safe Drinking Water Act additional criteria development is essential.

Second, States must classify their ground water and adopt ground water quality standards using USEPA's criteria as guidelines.

Third, upon adoption, each State's standards become the basis of cleanup or control for any and all Federal programs, in relating to ground water.

Fourth, States must define and implement programs to minimize degradation by assuring attainment and maintenance of ground water standards.

Fifth, State ground water programs must address contamination sources of national concern.

New Federal funding authorization for the States is not required to implement the recommended Federal legislation if these five principles that I just articulated are adopted. However, if prescriptive Federal legislation is passed by the Congress, States will need significant additional funding to carry out these program responsibilities.

Mr. Chairman, ASIWPCA is supportive of Senate bill 20 because it provides the basic framework for a rational, workable, and effective national ground water program. To enhance its foundation

ASIWPCA has some suggestions which we have included in the attached marked-up version of S. 20.

In closing, Mr. Chairman, we ask that a copy of a recent ASIWPCA report titled America's Clean Water, The States Nonpoint Source Assessment and the proceedings of the ASIWPCA's recent State ground water technical exchange seminar be included as part of this record.

Again, I want to thank you for your invitation to represent ASIWPCA and provide this testimony.

Senator MOYNIHAN. We thank you. We will make your publication a part of the file of this hearing.

Before you go, I want you to do it once more, pronounce that acronym. ASIWPCA?

Mr. REHEIS. ASIWPCA, yes sir.

Senator MOYNIHAN. Very well. Thank you.

Mr. Bell.

Mr. BELL. Thank you.

STATEMENT OF CRAIG BELL, EXECUTIVE DIRECTOR, WESTERN STATES WATER COUNCIL

Mr. BELL. I'm the Executive Director of the Western States Water Council which is an organization comprised of representatives appointed by the Governors of 16 western States. We address a broad range of policy issues. This one is an important one to us, the protection of ground water quality.

We have addressed this issue for some time and have adopted basic positions with respect to what national ground water policy should be. My statement is based on those principles that we have adopted. We've also prepared a report which we hope might be a useful reference to this committee and other congressional committees which describes on a State-by-State basis ground water quality and quantity programs.

Senator MOYNIHAN. If that's agreeable to you we'd like to make that a part of the file of this hearing.

Mr. BELL. Thank you, very much. Yes, I appreciate that.

The protection of ground water quality and its allocation for beneficial use have been traditional State responsibilities. We think it makes sense that those two responsibilities remain primarily at the State level.

The Western States are geographically and economically diverse so water quality programs differ from State to State. But it is important that all western States have programs and institutions designed to protect ground water quality. Likewise, in addition to those water quality protection programs, virtually all western States have programs for allocation of beneficial use.

There seems to be widespread agreement—and I heard reference today in some of the remarks of members of the committee—that States should continue to have the exclusive responsibility with respect to the establishment and administration of ground water rights. I think that's probably the most important thing I could say at this hearing today. I think that's true. However, you can't divorce the two.

There needs to be coordination—and there certainly is coordination—at the State level among the agencies, at least as a general rule, that deal with ground water allocation and ground water quality protection. So I think this speaks also of a policy of primary State responsibility in protecting the resource.

We believe that it would be inappropriate for Congress to enact ground water legislation mandating that State programs meet rigid requirements and criteria which may not be applicable in the west. We believe that any national policy should be built upon individual State strategies and responsibility for ground water use, management, and protection.

With respect to the report that we just submitted, this is a very dynamic area. This is an update of the 1982 report. It will soon need to be revised because many of the States are upgrading their programs. We find, as is indicated by previous witnesses, that there is a great deal of momentum in this area at the State level for change in addressing not only State interests but national interests in protecting the resource.

We hope that as this committee and others within Congress consider legislation that they would consider the following basic principles:

First, any Federal policy should provide the necessary flexibility for the States to develop programs appropriate for their own circumstances, with foundation elements which include aquifer protection standards or alternative criteria to protect all beneficial uses of ground water; and secondly, implementation of strategies and mechanisms appropriate to assure ground water protection.

Second, any Federal funding that is provided should be available for program development and implementation of State ground water strategies. To provide funding only for development would penalize those States that have already developed their programs.

Third, we think technical assistance is important. If legislation is passed we hope that a major component might be increased technical assistance and support.

Fourth, and lastly, we would hope that legislation might incorporate a "good neighbor" policy that requires all Federal agencies to conduct their activities which have the potential to affect ground water quality in accordance with State ground water protection programs. Federal lands, as you know, constitute a major portion of the lands in the west. We find that many of the problems of ground water contamination have resulted from Federal activities on Federal land. So we hope that that kind of policy might be incorporated in Federal legislation. That is, these kinds of things should be coordinated in accordance with State ground water quality protection programs.

We've urged our States to be responsive to the problems that exist and we find that they are responding, in the main, to the challenges that exist and are upgrading their own programs. We realize that situations are different from State to State and find that site-specific solutions are the best to handle these kinds of problems and that site-specific solutions are particularly appropriate at the State and local level.

These recommendations are based on assertive and effective State protection programs. I can assure you that we, as Western

States, are committed to that objective and support that kind of approach at the State level.

Thank you.

Senator MOYNIHAN. We thank you, Mr. Bell.

Mr. Morris, I believe you're next, sir, and represent the Interstate Conference on Water Policy.

STATEMENT OF JOHN MORRIS, CHAIRMAN INTERSTATE CONFERENCE ON WATER POLICY, ACCOMPANIED BY JOAN KOVALIC, EXECUTIVE DIRECTOR

Mr. MORRIS. Thank you, Mr. Chairman.

I am serving this year as Chairman of the Interstate Conference on Water Policy (ICWP) which is an association of State and interstate and regional water administrators concerned with water quality and water quantity. I'm also the Director of the North Carolina Division of Water Resources.

ICWP has been a spokesman for State concerns within the Federal system since 1959 and we greatly appreciate your invitation to testify here today. I'd just like to make a few key points today and we'll also be submitting a written testimony.

First, we want to stress that the primary management responsibility for ground water lies with the State and local governments. Ground water problems are frequently primarily localized and the sources of ground water are extremely diverse and numerous. We believe that the best way to protect ground water quality is to strengthen the capability of local governments and State governments to deal with this very complex situation.

In 1987 our organization conducted a survey of the States to get information about their ground water programs and about the problems that they were experiencing in protecting ground water. We had a very high response and 48 States out of the 50 replied to our questionnaire. This survey—and Mr. Chairman, we're also submitting this for your record and consideration by the staff.

Senator MOYNIHAN. We're very happy to receive that for the file. What is its title?

Mr. MORRIS. Ground Water Survey 1987.

Senator MOYNIHAN. Your ground water survey?

You've all brought the documents.

Mr. MORRIS. The conclusion of this survey is that most States are already regulating most of the sources of ground water pollution. There are some holes in the State programs. In some cases, States lack the regulatory authority or the resources or the proper organizational base to cover some of the ground water pollutants, but we are encouraged that the States are moving ahead very vigorously to fill these holes.

I'll just mention that in North Carolina Governor Martin has just recently proposed a major reorganization of State government health and environmental agencies. There were several motives for that reorganization, but the primary one is to give North Carolina a better capability of protecting ground water quality.

Senator MOYNIHAN. Is that right?

Mr. MORRIS. That is true, sir.

He's proposed the creation of a new department of health and environment which would bring together the solid and hazardous waste regulation activities—which had previously been in separate departments—with the ground water quality programs. He also brought together two separate agencies that had been involved in regulating septic tanks.

Senator Moynihan. That's sort of the point that Mr. Reheis made.

Mr. Morris. We believe that Federal ground water efforts should be specifically designed to take these active State programs into account and to compliment the State programs so that the total effect is a national ground water strategy that gets the job done. We want a partnership arrangement with the Federal agencies.

Second, we believe that the highest priority for Federal action in ground water protection is in the area of research, technical assistance, and improved funding and support of the existing ground water programs. Major research efforts that we need in ground water are beyond the capabilities of the individual States and it would also be inefficient to try to accomplish this at the State level. I'll just mention one example which we think is probably the highest priority research need, and that is establishing tolerance levels and standards for human health factors for ground water pollutants.

As States develop their ground water programs further, they can greatly benefit from Federal Government technical assistance. We urge Congress to provide a very flexible and strong technical assistance program for the States.

I'd like to make a comment about the existing cooperative program of the U.S. Geological Survey, which has already been discussed. This program allows the States to put up half of the funds and to have that matched by Federal funds, but then the content of that program is shaped by our State water management needs and priorities. I would mention that in addition to putting up funds, we can also put up "in-kind" services to match Federal funds. That's a very valuable way for us to train our own personnel and to give them the kind of hands-on experience that they can later bring back to our State agencies when that particular project is finished. In fact, one of the best things Congress could do is to increase funding to allow the G.S. to give more "in-kind" service credit which would provide a very powerful stimulus to States to develop their own ground water staffs to provide that "in- kind" assistance.

Senator Moynihan. If I could just say to my colleagues, I think that in the course of this hearing the Geological Survey has come into our purview in a way that's very useful.

Mr. Morris. The third point I'd like to make is that Federal ground water legislation should not be rigid or standardized across the country. Ground water is extremely diverse in the United States both in terms of its natural occurrence and conditions and also very diverse in terms of the type of pollution problems that we are facing. We don't believe that it will work to try to put these different situations into a standardized program mold that would have to be uniform across the country.

The fourth and last point is that we believe that Federal groundwater initiatives should be carefully coordinated with the existing programs both for cost-savings and for administrative efficiency. Congress has provided some major environmental legislation, the many major acts that have created our major environmental protection programs. At this point in history there's very limited room left for a major, separate new initiative on ground water because many of the existing Federal statutes already deal with ground water.

Senator Durenberger. Say that one all over again would you please, just that sentence. I'm not quite sure I heard it.

Mr. Morris. We believe that the many existing Federal environmental statutes already deal with ground water in one way or another. This point was made by ASIWPCA's testimony in which you might have a very similar factual situation that's already regulated under several different statutes.

Senator Durenberger. Then there was a conclusion at the head of that, wasn't there?

Mr. Morris. We're not convinced that there is really room on the ground left for a major new, independent, free-standing statute on ground water that would create a new program and a new approach because a lot of that terrain is already occupied by the existing statutes and also by the State programs that exist.

Senator Baucus. Do you want to bury some of them?

Ms. Savage. Yes.

Mr. Morris. I don't have any comment on that right now, today, sir.

Senator Moynihan. Ms. Savage commented very quickly.

Mr. Morris. Just to conclude, we would like to say that we believe that we can accomplish very much by getting more productivity and mileage out of our existing programs. The USGS coop program, the existing water resources research institutes, and the existing U.S. Geological Survey agencies in every State are a good method for research, technical assistance, and technology transfer.

Mr. Chairman, we appreciate this opportunity to testify and, with your permission, we'll be submitting for the record this ground water survey, also a 1983 white paper that our organization did on ground water and another document on ground water policy.

Thank you, sir.

Senator Moynihan. Thank you, Mr. Morris.

I appreciate the opportunity to put into the record your remark that ground waters vary. Somewhere in the recesses of my mind come a line of Jellyroll Mortons that, "Mississippi water tastes like sherry wine. Georgia water tastes like turpentine."

Mr. Buchanan we welcome you.

STATEMENT OF THOMAS J. BUCHANAN ON BEHALF OF AMERICAN WATERWORKS ASSOCIATION, ACCOMPANIED BY LOUIS MIRANDO, VICE PRESIDENT AND CHIEF ENGINEER, LONG ISLAND WATER CORP., LYNBROOK, NY; AND BEVIN A. BEAUDET, DIRECTOR, PALM BEACH COUNTY WATER UTILITIES DEPARTMENT, WEST PALM BEACH, FL

Mr. Buchanan. I'm Tom Buchanan and I am a member of the Environmental Engineering Consulting Firm, CH2M Hill. This afternoon I am representing the American Waterworks Association. With me, and sitting directly behind me, are Bevin Beaudet who's the Director of the Palm Beach County Water Utilities Department in West Palm Beach, Florida; and Lou Mirando, who is the Vice President and Chief Engineer of the Long Island Water Corporation in Lynbrook, New York.

Senator MOYNIHAN. We welcome you both, gentlemen.

Mr. BUCHANAN. They will be available to answer any questions that any member of this committee might have.

We have submitted our statement for the record, Senator and we are preparing formal answers to the ground water questionnaire and we will have that forwarded to you in a few days.

What I would like to do is just summarize our testimony and outline for the committee the recommendations that we have.

First, I'd like to just talk a moment about ground water protection. We at the American Waterworks Association believe that existing sources and potential sources of drinking water must really be protected for our future generations.

Ground water is a vulnerable resource. It's susceptible to industrial, agricultural, municipal, underground storage tank, deicing salts, and septic contamination. We need to develop innovative management strategies to protect this resource. We also need a joint commitment and cooperation among Federal, State, and local agencies and the water purveyors to accomplish this.

We put together a set of nine recommendations, eight for the committee and one recommendation for our members.

The first one relates to the role of the State and Federal Government. We believe that State and local governments have the primary responsibility for the management of the ground water resources. Even interstate aquifers can be successfully managed by the States working cooperatively. We believe that the Federal role is establishing health-based drinking water standards, providing strong guidance to the States on establishing local ground water contamination levels allowable, focusing Federal research efforts, assisting the States in cleanup efforts, providing back-up for States on legal or enforcement actions, and reviewing or coordinating State programs to insure continuity and a national direction.

On ground water protection the States, with Federal guidance, should classify aquifers based on present and future use of ground water. Contamination sources should be identified, regulated, and eliminated.

The American Waterworks Association supports the registration and the monitoring of underground storage tanks, land fills, hazardous waste disposal sites, lagoons, and industrial discharges. State government and Federal Government must address the regional issues of the application of fertilizers and pesticides and the application of de-icing salts on our highways. We believe that the States must address the issue of septic tanks.

On ground water quality, we believe that the most important use of our ground water resources is for drinking. Aquifer quality must be protected. For aquifers that cannot be expected to be used as a drinking water source, we recommend the development of standards for alternative uses such as industrial and irrigation uses and the responsibility of the State and local governments to set these standards.

On ground water quantity, we believe that the control of withdrawals should be based on a knowledge of the aquifer capabilities. We support the concept of artificial recharge. We believe that withdrawals must be metered and controlled in critical areas to provide aquifer protection. We also believe that conservation measures should be implemented and enforced in critical areas.

Senator MOYNIHAN. Not to interrupt, sir, but artificial recharge, what is that?

Mr. BUCHANAN. Artificial recharge, Senator, consists of——

Senator MOYNIHAN. I can imagine what it is, but is it a serious option?

Mr. BUCHANAN. It's taking waters that are available from other sources and applying them to the ground and letting them seep through or taking and drilling wells into the aquifer system and putting that water into the aquifer system through the wells.

There are some major projects going on in this country. Right now, Tucson and Phoenix are looking very effectively at artificial recharge because they believe it's a way to store the central Arizona project water. There is a lot of aquifer storage and recovery in the State of Florida. There is a lot of use of treated effluent for land disposal and that water eventually seeps into the ground to recharge the aquifer system. So we think by proper management of our water resources by artificial recharge we can enhance our aquifer systems.

Senator MOYNIHAN. OK, proceed.

Mr. BUCHANAN. The fifth recommendation we have relates to restoration and remediation of contaminated ground water. Aquifers that are the only reasonable source of drinking water should be considered for cleanup. Programs to remedy contamination must be based on sufficient technical understanding of the resource. We must increase our efforts to find technological solutions to these contaminated situations.

The sixth recommendation relates to the need for Federal legislation. We believe that Federal legislation is needed in the area of research funding. We hope that the Congress would fund the wellhead protection program. We believe that there's need for training and guidance programs from the Federal to the States. There's a need for a centralized information system and there's a need for assistance on the cleanup of critical aquifers.

Our seventh recommendation relates to Federal technical assistance. We believe that the Federal agencies can assist the State and local governments on ground water protection, ground water monitoring strategies, ground water treatment, remediation, and aquifer restoration.

Our eighth recommendation relates to Federal program coordination. We believe that the Congress needs to identify the roles of Federal agencies in ground water issues and develop a coordination mechanism to eliminate overlap, to eliminate duplication, and to fill the gaps where there may be gaps in the Federal role.

Our final recommendation is a recommendation that we have made to our members that the American Waterworks Association encourage the water utilities to initiate and support State and local ground water management programs and to become active participants in the States where such programs exist.

We thank you for the opportunity to be here this afternoon and Bevin, Lou, and I will be available to answer any questions that any member of the committee might have.

Thank you, sir.

Senator MOYNIHAN. We thank you, Mr. Buchanan.

Now the whole of the panel has been heard from and so we'll address questions as Senators choose.

Senator Baucus.

Senator BAUCUS. Thank you, Mr. Chairman.

I'll address this to you, Ms. Savage and Mr. Reheis.

The question goes to the advisability of States adopting the nondegradation approach. Administrator Thomas felt that no Federal legislation should contain any nondegradation provisions but that if the State chose to do so that would certainly be appropriate. Recognizing some of the problems that are inherent in adopting the nondegradation approach—you're closer to the States—can you give us the benefit of your experience as to what States have nondegradation provisions and how well they are working? And any other appropriate comments you might have.

Mr. REHEIS. Senator, I'm not aware of any States that have a strict nondegradation program for ground water. It is my opinion that nondegradation, in a strict sense, cannot be achieved. I agree with Mr. Thomas, you cannot have any kind of human activity, whether it be development on septic tanks or agricultural use of the land, without creating some amount of degradation. I believe that a goal of antidegradation is certainly needed and is achievable and would be supported by the States.

I think that Ms. Savage might want to amplify that with some lessons learned under the Clean Water Act.

Ms. SAVAGE. Senator Baucus, in 1972 when the Clean Water Act was passed, we had a zero degradation/zero discharge goal outlined in the Clean Water Act. In 1977—with Administrator Ruckleshaus and other key figures being part of the Water Quality Commission that examined this and other issues—it was determined by that Commission that zero discharge was an unrealistic and unobtainable goal. The Commission suggested that we needed to set for the water program, as well as our other environmental efforts, reasonable and achievable goals so that we don't build a public expectation that we will never achieve. We would be very concerned about legislation that tells the American people that we're going to do something when realistically we know we can't.

Senator BAUCUS. Yes, I understand the problems.

The State of Montana has a nondegradation policy. I am curious, how far do you think that States should go moving toward the complete nondegradation policy?

Administrator Thomas pointed out the limitations, you have too. But he also said that we should move much more toward prevention which approaches nondegradation as a limit. So again, I ask the question as to the degree to which the States are moving toward nondegradation and any advice you have as to how we can help facilitate that.

Mr. **Reheis**. I think all the States are moving toward nondegradation, but more are in the mode of prevention and antidegradation. As I said, I don't think nondegradation can, in truth, be accomplished. But by virtue of the fact that we have numerous Federal laws which have created a great deal of ground water protection activities and cleanup activities in this country in the last several years, all of the States are highly sensitized to the value of ground water——

Senator **Baucus**. Let's deal with some specifics here. Can you give me some examples of some States that have moved very far in that direction and just candidly tell me what components, what parts of that have worked and which have not and why? Give me some examples, some specifics and get away from the abstractions. Someone once said that abstraction is cruelty. There's a lot of truth in that. Let's get down to some specifics.

Ms. **Savage**. We'd like to submit that for the record but I can give you some examples. Connecticut has an outstanding program that they've had in place for many years. Arizona, Georgia, Idaho, Wisconsin and California have programs that are on the cutting edge of ground water legislation and programs that look at the broad range of protection activities. We'd like to come back to you with a very specific response to that. We will work with EPA and Lee's response.

Senator **Baucus**. If you could, please.

[The information referred to follows:]

States, under the auspices of the Association, emphasize that groundwater programs should minimized degradation. Antidegradation is not a useful goal or management tool given the pervasive extent of human activities.

While all the States surveyed below address the issue of degradation, they do so in different ways. They emphasize practical approaches which focus on preventing problems and efficiently controlling polluting activities. They do not to get bogged down in the semantics of anti vs. non-degradation goals. Their goals are supplemented by other strong considerations which drive program activities. While Arizona's law does not contain a non-degradation goal, for example, groundwater is no less protected than in other States due to its very extensive pollution control requirements.

Arizona

State law does not allow discharges to exceed groundwater standards. Waters can, therefore, be potentially degraded up to the standard. However, this is mitigated by the law's extensive requirements regarding permitting, enforcement, pesticide application, and agriculture (see attached Proceedings, page 3).

Connecticut

The goal of the State's program is to provide water suitable for drinking -- without treatment. The program is by and largely geared to antidegradation. However, their efforts focus primarily on regulating activities through permits, etc [as opposed to emphasizing use of groundwater quality standards criteria]. Discharges are prohibited to most (90%) of the State's groundwaters. In the future, the State anticipates that efforts will be expanded under a wellhead program to cover activities more comprehensively through land use management (see Proceedings, page 10 and 15).

Idaho

The State's water quality standards apply to both surface and groundwaters. All groundwaters are classified for drinking water and to some extent there is potential for limited degradation.

Separate groundwater standards are proposed for promulgation which add a special aquifer classification which sets the background groundwater quality as the standard (anti-degradation). Action levels are also proposed (at 50% of the standard) which, if exceeded, would trigger State management activities (e.g. notification requirements, monitoring) and performance requirements (e.g. permitting, limitations on land disposal, etc.). This is an non-degradation type approach.

Wisconsin

The goal of the State's program is to minimize impacts on groundwater (non-degradation). Standards have been established as well as preventive action limits -- which, if exceeded, trigger regulatory actions (e.g. permitting, closures, land management controls) as well as application of stringent design requirements for pollution control.

Senator **Baucus**. I understand and am sympathetic with statements all of you have made about the peculiar nature of ground water and how it makes it much more difficult and perhaps even inadvisable for Federal standards—certainly along the lines in ambient standards on the lines that Lee Thomas mentioned. I understand that.

Certainly in the west we have unique problems and unique differences and so forth. But nevertheless, I think it's important for us to force ourselves to move as expeditiously and as forthright as we can to find ways to solve the problem. I'm just trying to force us to move quickly by asking these questions—assuming what the right answers are.

Ms. **Savage**. I understand.

In fiscal year 1987 the Congress provided $7 million in section 106 of the Clean Water Act for States to deal specifically with ground water. In fiscal year 1988 they deducted $10 million, reducing not only ground water money but an additional $3 million. For fiscal year 1989 the USEPA is saying that States will receive static funding. But in truth, with the set-aside for Indian tribes the States are even getting less. So you'll have to remember that our expectations need to be viewed in the context of, historically, how the Congress has looked at these programs when it comes to funding the various activities.

Senator **Baucus**. One quick question. What about RCRA and FIFRA? Do you have any strong feelings as to how we should change either of those two statutes as it affects ground water? Any of you, any of the panelists, who have any strong reactions to that question.

Mr. **Reheis**. I don't think RCRA needs to be changed any more, sir. It is highly protective and highly restrictive as it is, and it would be difficult for me to imagine making it more so. With regard to FIFRA there is——

Senator **Baucus**. What about less so?

Mr. **Reheis**. Pardon?

Senator **Baucus**. What about less so?

Mr. **Reheis**. Less so would allow a considerable amount of equity to come into the program that is not there now.

Senator **Baucus**. You recommend less so?

Mr. **Reheis**. What I would recommend is State water-quality standards based on health-based criteria from the U.S. Environmental Protection Agency, those standards being the standard of cleanup or protection.

Again, a RCRA facility has to cleanup ground water contamination to zero. A CERCLA facility, which may have been abandoned a year or two before a RCRA facility, has only to do whatever is deemed to be cost-effective, and that may be considerably different. You can drive a company completely out of business that is right next to one that won't have any penalty simply by the differential in the two laws right now. If the shallow ground water is not essential as a drinking water source in the area right around a RCRA facility a practical approach as to how much cleanup is required, would be valuable in many parts of this country. Such flexibility could be allowed with the approach that is described in Senate bill 20.

Senator **Baucus**. Could you, for the record, give me examples of areas where the application of RCRA is, in your view, inappropriate because it unnecessarily restricts the discharge in areas where ground water is not used? I'd like some examples for the record.

Mr. **Reheis**. I can give you one example in my own State of Georgia, sir. In extreme south Georgia we have a very rural area. There are numerous wood-treating companies, that use either creosote or pentaprophenol to preserve wood for power poles and so on. These companies have tended to use a waste water lagoon which typically leaks into the shallow ground water. In this area of south Georgia we have a high ground water table, but nearly all of the drinking water comes from deep aquifers. RCRA regulations require a small company with a leaking waste lagoon to clean up the shallow ground water around it to background quality levels, even though no person uses that shallow ground water for drinking purposes.

In the February 23, 1988, Hearing, Senator Baucus asked Harold Reheis for specific examples of areas where RCRA requirements may be inappropriate because they unnecessarily restrict discharges in areas where groundwater is not used (see page 130, lines 7-11 of Hearing transcript).

Response for the Record:

There are at least four situations in Georgia where industries with previously existing hazardous waste land disposal units are required by RCRA regulations to clean up groundwater contamination to natural levels in spite of the fact that the ground water around and downgradient from these facilities is not used for drinking water. These are Atlantic Steel, AZS Chemicals, and Lockheed Corporation, all of the Atlanta area, and Union Carbide in south Georgia near the town of Woodbine.

GROUNDWATER MANAGEMENT IN GEORGIA

INTRODUCTION

The Environmental Protection Division (EPD) of the Georgia Department of Natural Resources has been conducting regulatory activities for many years to protect ground-water in the State. A comprehensive ground-water management plan was developed in 1984 to assure coordination of the various elements of Georgia's ground-water water programs, and implementation of the plan began that same year. A brief summary of the plan follows.

The Georgia ground-water management plan places emphasis on management activities to prevent pollution, to protect aquifers, and to coordinate the administrative functions within EPD so that adequate quantities of high-quality ground water will be available for future generations.

GOAL

> "It shall be Georgia's goal to protect human health and environmental health by preventing and mitigating ground-water pollution. To do this, Georgia will assess, protect, and where practical, enhance the quality of ground waters to the levels necessary for current and projected future uses and for the public health and significant ecological systems."

This goal, which is consistent with federal (EPA) strategy as well as the National Governors' Association's **Principles for Ground Water Policy**, recognizes that all ground water is not of the same value. The goal is primarily preventative, rather than curative; it also recognizes that ground-water resources should be maintained at their present level of quality or improved.

Of course, newly discovered ground-water quality problems should be remedied to the extent possible; but the long-term objective of the plan is to prevent ground-water contamination before it occurs, rather than to clean it up after the fact.

STATUTORY AUTHORITY

The Environmental Protection Division (EPD) of Georgia's Department of Natural Resources (DNR) has primary responsibility for administering and enforcing State and federal water quality laws. Of Georgia's 16 environmental laws, the following 11 are related directly to ground-water protection and management.

- Water Quality Control Act
- Solid Waste Management Act
- Hazardous Waste Management Act
- Surface Mining Act
- Safe Drinking Water Act
- Ground-Water Use Act
- Oil and Gas and Deep Drilling Act
- Georgia Radiation Control Act
- Underground Gas Storage Act
- Water Well Standards Act
- Underground Storage Tank Act

THE GROUND-WATER MANAGEMENT PLAN

Georgia's ground-water management plan consists of three principal elements, namely:

- protection of ground-water quality;
- management of ground-water quantity; and
- monitoring of ground-water quality and quantity.

Each of these elements is discussed in detail below.

The basic mechanism that Georgia uses to manage its ground-water resources is EPD's environmental permit system. Through its permits, EPD can permit, deny, modify, or revoke withdrawals and discharges as well as other activities such as mines and landfills so that the ground-water regime can be protected. And if protection cannot be achieved through the permit process, EPD may invoke civil and criminal penalties so that compliance can be achieved.

In addition, through the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) programs, EPD has the legal mechanism to assure clean-up of polluted ground water at hazardous waste sites. Also as part of the Water Well Standards Act of 1985, EPD, through the Water Well Standards Advisory Council licenses, water-well contractors as well as establishes siting, drilling, grouting, casing, and plugging procedures for water wells, monitoring wells, dewatering wells, and engineering/geologic borings.

PROTECTION OF GROUND-WATER QUALITY

Georgia has three options in selecting overall ground-water quality goals. They are:

(a) **Non-degradation**. Ground-water resources are maintained at their present levels of quality or improved;

(b) **Limited Degradation**. Aquifers are allowed to degrade to a specified level designed to protect health or both health and welfare.

(c) **Use Oriented Protection**. Ground-water resources are prevented from deteriorating significantly, preserving them for present and future uses. Selecting this goal means that aquifers are protected to a greater or lesser degree according to their existing quality, current use, and potential for future use.

Georgia will protect its ground-water resources by pursuing option A, recognizing that total non-degradation is not achievable, since essential human activities, such as agriculture and use of septic tanks will necessarily result in some degradation of the shallow, percolating water in the ground. Non-degradation of Georgia's aquifers, however, is achievable and is the goal.

EPD prevents aquifer contamination through its permit programs which include proper siting, construction, and operation of the following:

(a) public supply wells,
(b) industrial wells withdrawing more than 100,000 gpd.
(c) agricultural irrigation wells,
(d) injection wells of all types,
(e) oil and gas deep drilling (and oil and gas production),
(f) sanitary solid waste landfills,
(g) hazardous waste treatment, storage, and disposal facilities,
(h) municipal and industrial land treatment facilities for wastewater and wastewater sludges,
(i) municipal and industrial discharges to streams and rivers,
(j) storing, concentrating, or burying radioactive waste, and
(k) underground storage tanks.

EPD attempts to detect and mitigate existing ground-water quality problems. To achieve this, EPD monitors aquifers and/or areas suspected to be susceptible to pollution (e.g., recharge areas). Where appropriate, EPD modifies permits so that existing ground-water pollution can be mitigated. Examples of mitigative activities might include: proper closure of landfills, decontaminating shallow aquifers, reducing pumpage in areas susceptible to saltwater contamination, requiring removal of underground tanks, proper plugging of abandoned wells and so forth.

Perhaps the most effective method of protecting ground-water quality is education on the consequences of ground-water contamination. EPD, through the State Geologic Survey's publication series, is publishing documents describing the ground and surface waters of Georgia and their characteristics. In addition, EPD has produced films focusing on current environmental issues such as hazardous waste. EPD also works with agencies such as the Farm Bureau and the Cooperative Extension Service of the University of Georgia College of Agriculture so that farmers understand what effect irrigation might have on overall ground-water supply. Similarly, EPD transfers information developed by the Extension Service and others regarding fertilizer, pesticide, and herbicide application techniques so that farmers will understand how these substances may enter and contaminate the ground-water regime.

MANAGEMENT OF GROUND-WATER QUANTITY

Before a new withdrawal permit is issued, there must be a demonstrable resource of ground water available to sustain the requested withdrawal on a permanent basis. in other words, the withdrawals are allocated so that water is available for future generations. EPD does not issue any withdrawal permits for those aquifers where total withdrawals may exceed recharge or where the aquifer is threatened by salt water.

In the same light, in areas of high water demand, EPD works with local governments and federal agencies such as the U.S. Army Corps of Engineers to develop comprehensive Water Management Plans. The Comprehensive Plans address matters such as water conservation, alternate sources of water supply ultimate available resource of water, waste treatment and disposal, well spacing, and so forth. The Comprehensive Plans, thus, in short, serve as the technical base for permit issuance or permit modification.

MONITORING OF GROUND-WATER QUALITY AND QUANTITY

EPD performs two types of monitoring: namely aquifer monitoring and facilities surveillance. Aquifer monitoring is designed to assess the State's ground-water resources including their susceptibility to pollution. Aquifer monitoring includes:

(1) The Georgia Ground-Water Monitoring Network which involves measurements of both water quality and quantity. This network includes 127 wells used to monitor quality in all of Georgia's major aquifers.

(2) Aquifer (water-level) measurements performed cooperatively by the United States Geological Survey and EPD. These involve about 1500 wells that are typically monitored on a twice-yearly basis.

Facilities surveillance, on the other hand, involves monitoring those facilities regulated by environmental permits. These include:

(1) Water quality monitoring of both active and abandoned hazardous waste facilities.

(2) Ground and surface water quality monitoring in the vicinity of many sanitary solid waste landfills.

(3) Water quality monitoring of public water systems.

(4) Water quality monitoring at municipal and industrial wastewater land disposal operations.

(5) Water quality monitoring of selected wells and/or systems in "sinkhole" areas.

Senator **Baucus**. Now that's why Georgia water tastes like turpentine.

Mr. **Reheis**. Only in that one little corner of the State, and around only one facility.

That facility's waste water was probably what Mr. "Jelly Roll" Morton was drinking when he wrote his song; all the drinking water in Georgia is now of excellent quality and I can assure you that none of it tastes like turpentine. Sadly, statements like that, while intended as a joke, undermines the integrity of credible State programs.

I know specific companies, for example, where there is no well within a mile or two of a particular small lagoon, maybe one-third the size of this room, and yet the owner of that lagoon is having to cleanup the ground water immediately around it to background levels and may well go bankrupt as a result.

Senator **Baucus**. Are there any provisions in Federal or State law that would allow for exemptions or other relaxations of the statute?

Mr. **Reheis**. There is an allowance under RCRA but to qualify for that allowance is an extremely arduous process and so far we haven't seen anybody who's been able to work through that because of the difficulties written into the Federal legislation.

Senator **Baucus**. Have you talked to Lee Thomas about that?

Mr. **Reheis**. I think we have in the past, yes, sir.

Senator **Baucus**. OK. Thank you.

Thank you, Mr. Chairman.

Senator **Moynihan**. Thank you.

Senator Durenberger?

Senator **Durenberger**. Thank you, Mr. Chairman.

I want to compliment all the members of the panel, not necessarily on their conclusions—I think they know where I stand on that—but on the fact that over the years that I've been privileged to be on this committee that they and their associations have always been very, very helpful to us in adding a sense of realism to what we do, and so for that degree I certainly appreciate it.

So that no one misses my personal concern about the bottom line of a lot of this testimony, first, in a constituent sense I represent a State that feels strongly that we need what Lee Thomas said, a national goal, a national will, a national strategy, a national consistency, a national momentum, a lot of those sort of things.

I represent a State which in testimony we took two weeks ago has set nondegradation as its goal, so you can put Minnesota down as one of those States. It may be that we're sort of a—just a little semantical battle here—maybe nondegradation, zero discharge, antidegradation, whatever, maybe we're kind of talking around the same sort of thing and we're not as far apart as we seem to be when we get stuck with just one part of the semantics.

The second reason that I have a deep concern is—and I've developed this over the time that I've been here—that I haven't heard a lot from this panel about the national role in helping the States in prevention. I know that's implied when you talk about research and things like that, but I hear a lot about help us with the cleanup and all that sort of thing.

I've sat here funding New Jersey's mistakes for so many years that I'm getting sick and tired of it. Now I'm in a position where I'm trying to get into the same program to take care of Minnesota's mistakes. I've taken all the incentives out of Minnesota prevention because you can always come here and say that when this problem reaches a certain level of national concern that we ought to have a national program to do the cleanup. But I think the important part of what we're talking about here is to start now to shift our national strategy in the direction of prevention.

The third reason that I feel strongly about this, again I'm the intergovernmentalist in the era of devolution now. We all know that. We're living in the era of mandates without the money to pay for them and all that sort of stuff. I recognize some of these realities. But what my deepest concern about this issue as it relates to, yes, it's a State responsibility and all that sort of thing, is that this is not a State issue, this is a rural issue. This is a small place issue.

Half the people in this country get their drinking water from ground water and 97 percent of the folks in rural America depend on it. You and I both know that, from where it was 25 or 30 years ago, State decisions are not being made by rural folks anymore. Even my State, which is supposed to be a rural State, in the next census is going to be 60 percent in the twin cities and 40 percent in the rest of the State.

So when you come to talking about how are we going to protect the drinking water of 97 percent of these people from 17 million septic tanks—this is national figures—17 million septic tanks, 4 million underground storage tanks, 2 million miles of pipelines, 200,000 surface impoundments, thousands of oil and gas wells, and surface mines to say nothing of the other issues we've been talking about here. Who's going to speak up for all these little people who are following the labels and then dropping rocks and tin cans and old pesticide cans half full back down into abandoned wells? Who's going to come along and help them test their wells? It's not going on in Minnesota. We haven't got the resources to test all the wells in the State to say nothing of the resources to help people cap some of these abandoned wells.

It strikes me that one of the things that I would like to hear from those of you who represent these pollution control/contamination control interests at the State level is to hear you speak to the national responsibility in this kind of practical context.

I understand it when you talk about we authorize and nobody appropriates. But you ought to be talking to us about the fact that this is a peculiarly rural issue. There's nobody in Pittsburgh that's concerned about anything other than the oil running down the Monongahela. But in the rural parts of that State, or in Wheeling or wherever it is, who's going to speak for—and everybody apparently now is out dumping their toxics in under the flow and hiding from it. But the out of sight, out of mind problems don't have people to just to speak for them.

So I think as we go about coming to a meeting of minds, which I'm sure we're going to do because you people have been so good about this in the past, I would certainly hope that as States rights people you keep in mind the peculiar nature of this problem, as compared with clean water or clean air or some of these other things. Maybe in the future you could help us argue for an appropriate national role in this regard.

So it isn't to say that we don't have—obviously I look over here to Long Island or I can look at Bob Graham through a water table that's only 20 feet under Florida and things like that. I recognize that it isn't totally a rural problem but it is one of those things that is uniquely rural, uniquely rural.

Senator **Moynihan**. Where you are rural you have this problem?

Senator **Durenberger**. That's right.

Thank you, Mr. Chairman. I don't want to take a lot of your time. I may have some questions that I'll submit to them.

Senator **Moynihan**. Thank you.

Senator **Moynihan**. You did mention Long Island. I wanted to ask Mr. Mirando, it is true, is it not, sir, that there's talk of desalinization activities on Long Island?

Mr. **Mirando**. Well the fact that it's surrounded by water leads to the conversation of desalinization. I think the responsible people on Long Island though consider it only as a long-time alternative because of its expense.

Despite the hysteria that you may read about Long Island, I think that there's a lot of very positive things in terms of the ground water situation on Long Island.

I might just take an opportunity to refer to your recent USGS report, number 854288, which in fact points to the conclusion that ground waters have recovered to their pre-drought levels in the water table, the drought I refer to being the 1962 to 1967 drought. In the deeper aquifers the water levels are, in fact, on their way back to pre-drought levels. This relates to probably the most critical area in Nassau County, southwest Nassau County, where a great deal of the hysteria exists.

When you extend that to the fact that we have such a huge land area, when we consider the entire island of Nassau and Suffolk County, perhaps six times the land area for twice the population, I think the long-term alternative of treating Long Island as one hydrogeologic system certainly would solve the problems for the immediate future.

Senator **Moynihan**. All right.

I want to make the point that the ideal water system is energy-free, as in New York City. The whole of the city did those five-story buildings as a result of an aqueduct built coming down from across the river, the Catskills, and brilliantly dug around 1905, a great V that shoots up five stories in Brooklyn, in the Bronx.

But when we hear about, as Mr. Buchanan was saying, recharge—of course we funded money for a study of the recharge of the Ogollala which is a big operation. I guess I'm told by our science advisor that Los Angeles is now currently recharging its aquifer to keep salt water out. Isn't that it? I see some nodding. These have got to be pretty energy-intensive. There has to be cost associated with this. I think we have much larger questions coming along than we perhaps have realized.

Thank you, Mr. Mirando.

Thank you all. We thank you for what you've done and what you've undertaken to do. This is the first of two hearings. We're very pleased with what we're learning and we're determined to move forward with it.

Senator Baucus, you're the cochairman of this hearing. Would you like to make some concluding remarks?

Senator **Baucus**. I also look forward to the next panel which, unfortunately, we had to postpone.

Senator **Moynihan**. Yes, and Mr. Baucus and I will announce that hearing as soon as we can find that time. Is it March 24th?

Thank you. The hearing is closed. We thank our panel and we thank our guests.

[Whereupon at 12:40 p.m., the joint subcommittees were adjourned.]

[Statements submitted for the record and the bills S. 20, S. 1105, and H.R. 791 follow:]

TESTIMONY
OF
LEE M. THOMAS
ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES,
TRANSPORTATION AND INFRASTRUCTURE
AND THE
SUBCOMMITTEE ON HAZARDOUS WASTES AND TOXIC SUBSTANCES
OF THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

February 23, 1988

Good morning, Chairman Moynihan and Chairman Baucus and members of the Subcommittees. With me today is Larry Jensen, Assistant Administrator for Water of the U.S. EPA. We are pleased to be here today to talk about one of the nation's most important environmental issues--the management of the quality of this nation's ground-water.

Ground-water protection is one of EPA's top priorities. Many of our programs and a large percentage of our budget directly support the protection of ground-water quality. As the Subcommittees begin your review of the country's current efforts to protect this vital resource, I would like to describe briefly for you three areas related to EPA's ground-water management program: 1) the extent of our knowledge of the resource and threats to its usability; 2) the authorities for protecting ground water under existing federal statutes; and, 3) principles which I believe should guide our future efforts to protect the resource from contamination.

Characteristics of the Ground-Water Resource

The importance of safeguarding ground-water quality is increasingly being recognized, not only in protecting sources of drinking water, but also with regard to other beneficial uses such as the use of ground water in agricultural production, mining, and manufacturing. About one-fourth of all the fresh water used in this country comes from underground. Ground water currently supplies 50% of the population's drinking water. It provides 35% of the drinking water supply used in urban areas and 95% of the supply in rural areas. One-third of the water used for irrigation in this country is drawn from underground. For the eastern industrial states, 30% of the ground water withdrawn is for use in industrial processes.

Although we are constantly expanding our understanding of the nature of ground water and the extent of contamination, we may never have a complete picture. Our current data on contamination by organic substances are fairly limited, and monitoring is very expensive and technically difficult. The best indicator we have of the extent of contamination comes from a national survey of volatile organic compounds (VOCs) in drinking water wells. We found that only about 2.5% of all public drinking water systems relying on ground water exceed the standards for VOCs. In addition, the survey showed that 20% of all drinking water systems using ground water, and 30% of the larger ground-water systems, contain between trace and drinking-water-standard levels of VOCs.

Over the years, our experience at EPA has shown that once ground water is contaminated, cleaning it up is difficult, expensive and sometimes unsuccessful. For many reasons, the clean-up of ground-water contamination is substantially more complex than the clean-up of surface water pollution.

One reason is that the rates of movement and mixing of ground water are dramatically different from those for surface water: ground water usually flows at a feet-per-year rate while surface waters flow at a feet-per-second rate. Second, ground water is not as easily accessible for monitoring. In fact, taking a sample of ground water usually involves drilling wells, and the information obtained may sometimes be quite different from data from a sample obtained only a short distance away. This means that it is nearly impossible to obtain a representative sample characterizing an entire aquifer. In addition, there is a shortage in many areas of the U.S. of highly skilled people to collect and analyze such data.

Another important reason why managing this vital resource is one of our most complex environmental challenges is that ground water is threatened by a wide variety of potential individual sources of contamination ranging from large commercial and industrial practices to small businesses, farmers, and home owners. The total number of potential sources is equally large and includes: approximately 1500 hazardous waste land disposal facilities; over a 1000 toxic waste sites; thousands of surface impoundments; thousands of non-hazardous waste land disposal facilities; hundreds of thousands of injection wells; over a million underground storage tanks; 23 million-plus residential septic systems; and the use of millions of pounds of pesticides and millions of tons of fertilizers by farmers, home owners and others. In short, managing ground water is a complex undertaking and requires that federal, state, and local governments work in concert to address such large numbers and varieties of sources. Since state and local governments are in the best position to make decisions about appropriate action in individual circumstances, they, of course, should have the lead role.

Statutory Authorities

Many sources of ground-water contamination are already being addressed under the authority of existing federal environmental statutes. Let me summarize briefly a few of these authorities.

The Resource Conservation and Recovery Act of 1976 (RCRA) and its 1984 amendments require controls on hazardous waste management to protect ground water from contamination originating in hazardous waste facilities, municipal landfills, surface impoundments and underground tanks.

The Comprehensive Environmental Response, Compensation and Liability Act (Superfund) provides EPA with major authorities and resources to clean up historical and current releases of hazardous substances to the environment. A significant portion of the work under this statute involves ground-water protection and remediation.

Through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), we control the availability and the use of pesticides which may present an unreasonable risk to human health or the environment if they leach into ground water. In support of the Agency's mandate in this area, we will soon release for public comment our proposed strategy for addressing the pesticides in ground water issue. We are also working on a National Pesticides Survey to help us assess the extent to which pesticides are leaching into drinking water wells. This survey supports our mandate under both FIFRA and the Safe Drinking Water Act (SDWA).

Under the SDWA, the Agency sets drinking water standards to ensure that water delivered to the tap is safe to drink. These standards, in turn, are used as reference points in many ground-water quality management decisions under statutes like RCRA, Superfund, and FIFRA. The SDWA also mandates control of the underground injection of hazardous and other fluids.

EPA's efforts are not, however, strictly regulatory in nature. We also provide assistance to states for the development and implementation of State ground-water protection strategies. Through the authority of the Clean Water Act, we have awarded the states slightly over $27 million dollars since 1985 to help them develop their strategies. And under the SDWA Amendments of 1986, we are providing guidance to assist states in protecting the ground water in the wells or wellfields of public water systems.

Through these and other statutes, a wide range of activities including standard setting, institution building, technical assistance, compliance, enforcement, research, and monitoring take place. In fact, last year the Agency released a report summarizing all of the Agency's activities that address the 33 sources of ground-water contamination that were identified by the Office of Technology Assessment (OTA) in a 1984 report. Our report lists some 270 EPA activities and programs, and points out that the Agency is addressing--either through regulatory programs or through non-regulatory efforts such as technical assistance, guidance, studies and research--25 of OTA's list of 33. Most major sources are being addressed. Not surprisingly, the Agency has a higher level of activity focused on sources that are directly regulated under EPA's statutory mandates. For the eight sources not addressed, they are either not of a high priority at the federal level--like material stockpiles, graveyards, or animal feedlots--or are from natural causes which we cannot address with protection activities.

I would also like to point out to the Subcommittee members that over the years EPA has developed a substantial ground-water research program to support our legislative mandates. Currently, this program includes a wide variety of research, development and monitoring efforts that are required to support our regulatory development, compliance, enforcement and ground-water clean-up responsibilities.

Other federal agencies also play major roles in the management of ground water: land management agencies within the DOI and the USDA; agencies which manage ground water at the facilities under their control such as the Department of Energy, the Nuclear Regulatory Commission, and the Department of Defense; and finally, agencies which characterize and map the ground-water resource such as the USGS and the USDA. Naturally, in order to foster consistency, EPA meets often and regularly with these Agencies to discuss and coordinate the ground-water management program.

It is clear, then, that existing statutes already provide the federal government with significant authority to address ground-water management in many different ways. Because of this, I believe there is no need for expansion of the federal regulatory role in ground-water management.

Principles to Guide Our Future Efforts

In the late 1970s, EPA recognized that the Agency's role in the area of ground-water protection was fragmented and largely undefined. As a result, in 1984, the Agency adopted a Ground-Water Protection Strategy that articulated principles that should guide EPA as it set about addressing the ground-water management challenge. My experience at EPA has convinced me that the principles set forth in our Strategy should continue to guide future national efforts to manage the resource. I would like to outline for you four principles in the strategy that I hope you will seriously consider in your discussions about the future direction of ground-water policy in this country.

First, the states should continue to have the primary role in the management of the quality of the ground water resources. Such management inevitably requires decisions about land use, including the siting of various types of facilities as well as the allocation of water which are appropriately the province of State and local governments. There is widespread agreement on this point among those who are concerned about ground water. For example, the Conservation Foundation, the Business Roundtable and the National Governors' Association are on record in agreement with this principle.

At this time, the states are actively involved in managing the quality of their ground-water resources. All states have developed or are developing ground-water protection strategies. This is due, in part, to the state ground-water strategy grants program under section 106 of the Clean Water Act.

Most state strategies not only attempt to develop comprehensive long-range frameworks for managing the resource, but they also seek to institutionalize ground-water protection at the state and local levels. With EPA's assistance, state agencies are working with their legislatures to assign a higher priority to ground-water management and to provide more state money for protecting the resource. States have also begun to map and characterize their ground waters, develop classification systems, implement quality standards and lay a sound foundation for developing wellhead protection programs. Consequently, most state and local governments have their own regulations and ordinances to manage ground water.

Second, while the states should continue their primary role in the comprehensive management of ground water as a resource, there is an important role for the federal government to play. The federal government has an appropriate role in controlling the use of certain toxic chemicals of national concern, in setting protective standards for major sources of contamination, in providing technical assistance, and in research and development in support of management and clean-up activities.

The federal role has been recognized by EPA in our Strategy and, as described earlier. EPA also has been given authority to deal with contaminants of national concern under several statutes.

The third principle, which I hope you will seriously consider, is referred to at EPA as differential protection. Differential protection means that the variability in use, value, and vulnerability of the ground-water resource is taken into account as decisions are made about how to manage the resource. At EPA, we have developed a three-tiered classification system for ground water to assist us in taking this variability into account. Differential protection is a way of focusing EPA's and society's resources on the most important areas as well as affording the greatest protection where the greatest potential risk is presented. Thirty-three states have adopted their own classification systems, recognizing that differential protection is the most logical and efficient way of managing ground water. The concept of differential protection has been endorsed by major national groups like the National Governors' Association and the Conservation Foundation.

Closely tied to the concept of differential protection is the fourth principle that I believe should guide our future efforts; we must distinguish between prevention and corrective action in our decision making, and we must put more emphasis on prevention. We have usually found that it is much more expensive to clean up contamination than it is to prevent it.

This is an issue the Agency is facing over and over again at Superfund sites. We are being pushed to spend hundreds of millions of dollars at Superfund sites to clean up very small levels of chemical contaminants that, in some cases, pose low risks to human health. Clearly, it makes more sense to recognize that there is a level below which science tells us there is no significant health threat, and to try to direct more of our resources toward prevention of future contamination. Federal, state, and local ground-water management programs should have the flexibility to evaluate clean-up and prevention strategies separately and to direct resources commensurate to the relative risk into either prevention or cleanup.

There is one other point that needs to be made. I believe it is important in any discussion of ground-water policy to bear in mind where the problem of contamination fits in the context of risks posed by other environmental problems as a whole. EPA recently undertook a comparative evaluation of 31 environmental problems from the standpoint of the risks they pose to human health and the environment. Surprisingly to some, the risks posed by contamination from sources such as leaking storage tanks and active and inactive hazardous waste sites, pesticides and other sources of ground-water contamination ranked low to medium when compared to other pollution problems like air pollution. I believe the relative risk of ground water vis-a-vis other environmental problems should be kept in mind as we address the ground-water issue.

Answers to the Specific Questions Posed by the Subcommittees

The questionnaire presented to EPA by the Subcommittees contains many questions concerning the specific legislative proposals under consideration today--H.R. 791, S. 1105, and S. 20. I would now like to take the opportunity to provide you with EPA's answers to the questions you have asked.

Q1. Is there a need for federal ground water legislation or are other federal statutes adequately addressing this need (especially SARA, RCRA, SDWA, CWA)?

The heart of this question is whether the national interest requires new federal control over sources of ground-water contamination. The simple answer is no. Current federal statutes are adequate to address the sources of contamination which the federal government should be addressing. These statutes provide federal controls for major sources of contamination, those generating the most toxic chemicals, e.g. SARA, SDWA, RCRA, AEA, and for significant contaminating chemicals, e.g. TSCA and FIFRA.

The federal government should not directly regulate sources of contamination which state and local governments have the responsibility, capability and resources to address. Such sources include septic tanks, fertilizer application, various industrial activities, transport loading stations, highway de-icing and many others. Many state and local governments are now making substantial progress in controlling these sources through siting and technology requirements, land-use controls, and best management practices. EPA and other agencies are providing support to states to develop their own technical and institutional capability to carry out this role.

Q1-A. Would a federal statute weaken other existing federal programs for ground water?

Not necessarily. However, new legislation must carefully take into account the federal statutes which already regulate activities or sources which already contaminate ground water.

Q1-B. What efforts could be made to integrate and strengthen all these statutes?

Based on our experience in the administration of our statutes, we can, and are administratively, seeking to consistently implement our existing statutes with our Ground-water Protection Strategy around three basic principles:

- EPA should have clear authority to harmonize the implementation of its various programs, and to establish a consistent health-protective reference point for decision-making regarding protection and cleanup for all programs.

- The use, value, and vulnerability of groun[illegible]er should be clearly factored into EPA decisionmaking. We would like to see EPA's differential protection policy as delineated in the Ground-Water Protection strategy become federal policy because it would focus attention on the most important areas.

- The ability to have flexibility within a structured decision making process, i.e., the ability to deviate from the basic reference point for protection and cleanup activities in carefully defined cases, should be clearly established.

Q2. Should the primary responsibility for ground water management reside with state and local governments, or should there be a national goal set by the federal government? Should there be a strict federal nondegradation policy, a limited one or should the states decide on nondegradation?

We believe that the primary responsibility for ground water management should reside with state and local governments. However, we oppose a national goal of nondegradation that would drive action at all levels of government.

EPA believes that ground-water quality decisions should reflect the use, value and vulnerability of ground-water. Since most land uses cause at least some ground-water contamination, a nondegredation policy (whether at the federal or the state level) would virtually eliminate many land use activities.

Consequently, we strongly oppose a strict nondegradation policy for ground water.

Q2-A. If there is to be a national goal, which agency should set it and what should it be?

EPA has administratively set a goal for differential ground-water protection which is consistent with its statutes. Since different agencies address different problems, a uniform standard set by one agency would not necessarily be appropriate for another. To our knowledge, the general concept of differential protection seems attractive to other federal agencies; however, further consultation with other agencies would be required to determine whether the specifics of EPA's approach, e.g. ground water classification guidelines, are readily transferable to to other federal agencies' programs.

> Q3. Do you support federal ground-water permits based on water quality criteria or federal source controls based upon potential for ground-water contamination? If so for what sources?

For the reasons indicated above, we do not believe that any additional sources of contamination should be regulated by the federal government. We currently administer programs which employ both water quality standards and source controls for surface waters under the Clean Water Act. Our experience has convinced us that neither of these approaches is suitable for universal application. For example, utilizing ambient ground-water quality criteria as the regulatory basis for all sources of contamination presents a variety of problems:

- many human activities cause at least limited contamination, e.g., septic tanks in the immediate vicinity of the resource.
- it is extremely complicated to predict or obtain an ambient concentration in the aquifer when controlling a particular contaminant source.
- the monitoring required to support an ambient standard is, at worst, technically infeasible and at best extremely expensive.

- **because of the unique characteristics of ground water, ambient monitoring would require a large number of wells, these may in turn alter the flow and the quality of the ground water.**

This type of approach is best used for relatively high risk, complex contamination activities, such as hazardous waste disposal, where it is feasible to support the needed work to predict and monitor potential and actual contamination.

Source control permits are also a useful tool for controlling some activities. But they can also present major problems when applied to sources that are very numerous and diffused:

- The administrative problems of issuing permits for several thousand hazardous waste sites are considerable; requiring source control permits for 23 million existing septic tanks, or for every use of pesticides and fertilizers on the land would be wholly impractical. Other approaches, e.g., management of septic tanks through local land use requirements, are far more efficient and feasible.
- Technology requirements needed to protect ground water should vary not only by the source to be controlled, but by the ground water hydrogeology and the risk to human health and the ecology. For example, expensive technologies which may be required for unconfined areas need not be applied where confining layers exist. Ground water protection requires an approach that is flexible enough to allow the regulating agency to use the approach which is best suited to a given source and site problem.

Q4. How should the activities of federal agencies be coordinated--by a committee designated by statute, a statutorily designated lead agency, or should this be the responsibility of the President?

Formal coordination of the ground-water research programs of Federal Agencies is desirable, but there is no need for legislation that statutorily designates a committee or lead agency.

The creation of lead agencies could create confusion and limit the ability of agencies to carry out their statutory missions.

Coordination is important, but the President already has in place existing mechanisms for that purpose. One example is the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET) which has recently established a subcommittee to improve scientific coordination in ground water. Other mechanisms include memoranda of understanding among federal agencies (USDA, DOI, EPA).

Q5. For each of the following functional activities describe the role you see each of the various federal agencies playing (including the funding and institutional arrangements, where appropriate), regardless of whether you approve of the function itself being carried out by the federal Government.

5a. approving of state plans for assessment, monitoring, protection, or management.

First, let me say that a legal requirement for federal approval of state plans defeats the purpose of assigning states the lead role in assessing ground water problems. We all agree that state and local governments are better able to manage the complex site-specific issues involved. An added layer of review by a federal agency removed from the actual situation is inappropriate. Having said this, EPA does have experience, as a result of the administration of its various statutes in the review of state plans and programs which involve the assessment, monitoring, protection and management of ground water. These plans and programs may be related to the receipt of a federal grant such as under the Clean Water Act for increasing states' institutional capabilities to administrator their ground-water programs. Or plans may be related to the delegation of federal authority to administer a federal program such as RCRA. In all cases our review and approval is directly related to the statutorily established mission of this agency.

Other agencies similiarly review and approve various state plans and proposals related to their missions.

5b. providing technical assistance on matters of hydrogeology, resource assessment, resource management, mapping of aquifers or recharge areas, or data management.

The USGS has and should continue to provide technical assistance in these areas. However, EPA's programs also necessarily involve work in these areas. We provide technical assistance to the regulated community and to state and local agencies which administer programs that fall within our statutory framework. We utilize the USGS expertise when appropriate and coordinate our efforts with USGS and other agencies such as USDA and DOE to avoid duplication.

5c. providing technical assistance on matters of health effects, criteria setting, mitigation strategies or remediation strategies.

As the principal environmental protection agency, EPA has the major federal role in each of these areas. However, other agencies also play an important role. For example, NIH, through the NIEHS and NCI, conducts the major health effects research and provides technical and scientific assistance to EPA and others on matters of health effects. The Department of Energy administers programs for controlling radioactive wastes at facilities under their jurisdiction. The Department of Defense also conducts major mitigation and remediation work. The USDA has research, educational, and technical assistance related primarily to agriculture, silvaculture, protection of rural population, national forest management and rural area environment.

5d. operating an information clearinghouse providing indexing of data, of literature (technical and lay) and of sources of expert advice and services to state and local government.

All information on ground water could not effectively be funnelled through one point.

EPA currently supports clearinghouses, e.g., one on modeling and another that is a bibliographic service on all published reports. Various EPA programs also provide information on specific areas of concern to the states and local governments and others are involved with carrying out statutory mandates, as well as to industry and the general public.

The USGS, DOE, USDA, and other agencies provide clearinghouses related to their missions.

5e. conducting research on hydrology, hydrogeology, fate and transport of chemicals in the subsurface, monitoring-network design, analysis of the vulnerability of ground water to contamination.

EPA must conduct those activities described in the question which are necessary to carry out our environmental management mission.

Because USGS is the basic earth science agency, EPA relies on its scientific work in meeting its program and regulatory needs.

5f. conducting research and development of techniques for preventing contamination from: agriculture, domestic waste disposal, industry (including extractive industries), and other sources.

As the principal environmental protection agency, EPA has the principal role in research, prevention, treatment and waste minimization. EPA research programs include land disposal technologies (landfill design, leachate collection and treatment, sludge and ash disposal); wastewater and technologies for treating hazardous waste prior to disposal, and techical assistance for minimizing hazardous waste residuals from industry and other. Likewise, given its mission, DOE has the principal role for comparable research related to disposal of radioactive waste and USDA for research related to farming practices. Agencies such as the USGS should continue to play a role in conducting research on which the regulatory agencies can draw in carrying out their own missions.

5g. conducting research on health and ecological effects of contaminants.

Important health and ecological effects research is performed by industry under EPA's supervision using TSCA and FIFRA. In addition, the National Institutes of Health and other HHS agencies conduct basic research on human health effects. EPA utilizes that research and conducts applied research which enable us to use that information in standard setting. EPA itself conducts significant amounts of research on the ecological effects of contaminants.

5h. conducting research and development on methods of remediation and treatment on contaminated ground water.

As a part of its responsibilities under the SDWA, EPA has conducted research on water treatment methodology. This is needed to establish and maintain standards for drinking water quality, and as a means of extracting contaminants from water at Superfund sites. This research is in support of EPA's mission.

5i. issuing health advisories.

EPA issues health advisories as a part of its responsibilities under the SDWA, when a formal drinking water standard has not yet been issued. Various agencies of HHS provide technical support to EPA in carrying out this function. Other federal agencies and the states use advisories in carrying out their programs. It would create considerable confusion to have several agencies at the federal level perform this function.

5j. conducting resource assessments.

National resource assessments are conducted primarily by the USGS at the Federal level. The states conduct more targeted assessments either directly through their state geologic or environmental agencies or through the USGS's Cooperative Program. EPA and state environmental agenices conduct resource assessments in conjunction with their environmental missions, e.g., to support Superfund and hazardous waste disposal activities or in the case of states, as one aid in the development of state classification systems. Assessments of specific aspects of the resource such as the extent of pesticide contamination of ground water are conducted by EPA to help develop drinking water standards and register pesticides.

Q6. How should the needed university research and educational programs related to ground water be strengthened (e.g., institutes, fellowships, competitive research grant programs) and how should these be administered?

The Water Resources Research Act (P.L. 98-942) is authorized through 1989. This Act funds 54 research institutions on a 40/60 federal-state matching basis. How can this program be incorporated into the new ground-water bills?

EPA has an existing research program that includes: a major ground-water research center composed of Rice Unviersity, University of Oklahoma, and Oklahoma State; Holcomb University Center for Ground-Water Models; and many individual research grants to universities throughout the country.

USGS's 54 research institutes also conducts research on many ground water quality issues.

Q7. Comment on the USGS' National Water Quality Assessment Program and how that relates to any of the assessments and studies in S. 20, S. 1105 and H.R. 791.

The National Water Quality Assessment Program is related to the following provisions of the two research bills: (1) Section 205(d) of H.R. 791; and (2) Section 202(b) of S. 1105.

We believe these provisions would prematurely authorize a full scale national ground-water assessment program before the Department of Interior's pilot "National Water Quality Assessment Program" (NAWQA) is completed and evaluated. EPA is participating in the NAWQA Pilot program as a member of their National Coordinating Workgroup.

The proposed NAWQA program is expensive and controversial. It is appropriate that the federal government take the time and effort necessary to examine the concept very carefully before making such a long-term commitment.

The National Academy of Sciences is conducting an evaluation of the NAWQA concept. They are scheduled to report their findings to the Department of the Interior by March 31, 1990.

Q8. Comment on EPA's classification system and how it relates to each of the three bills?

There are substantial similarities and differences between EPA's classification system and the classification system envisioned in S. 20. (S. 1105 and H.R. 791 do not address classification systems. They address related information collection, but do not address the application of that information in a regulatory context).

With respect to the similiarities between S. 20 and EPA's classification systems, both recognize that all ground water is not the same; that its use, value and vulnerability must be factored into decision-making on ground-water protection and cleanup. Both approaches envision differential protection of the resource. Both approaches also recognize that some ground water will require more stringent controls because of the high risks presented to human health and the environment if the ground water becomes contaminated, and that other ground waters, which are not useful for drinking, may require less stringent controls.

There are also differences between the two approaches. EPA's system is intended to achieve a consistent decision-making process for addressing ground-water contamination, prevention, and clean up. In contrast, S. 20 is designed to provide a framework for all ground water related decisions, including those now made exclusively by the states. EPA's system provides for basic protection but allows states to establish more stringent requirements. S. 20 allows the states to determine standards that can be applied to all federal programs as well. This could encourage states to establish unnecessarily stringent standards for federally-funded programs.

Furthermore, EPA expects that its system will be used primarily in conjunction with site-specific regulatory decisions, e.g., permits, site cleanups. In contrast, S.20 contemplates an anticipatory classification system, one that designates class before a specific decision needs to be made.

Another difference is that EPA's classification system specifically defines the ground waters which would fall into each class whereas S. 20 does not clearly define "special ground water systems". We are concerned that the lack of criteria for those areas could have unintended effects.

This appears to be more permissive than EPA's Classification framework which limits its "class III" areas to those which contain ground water which could not be utilized by a public water supplier for drinking purposes using conventional treatment methods.

A further distinction between the two approaches is S.20's direct link to ambient standards. We do not believe that this is scientifically feasible or practical way of protecting ground water as outlined elsewhere in my testimony.

The effect of the two approaches would be substantially different. EPA's approach is to seek consistent EPA decisions from program to program, state to state. S.20 would achieve greater consistency within a given state; however, giving the states such broad discretion over current federal programs could create differences state-to-state in the way that federal programs are administered. These differences would not necessarily be a consequence of differing hydrogeological conditions, nor would they be the intent of the statutes which govern the programs.

Finally, we take issue with several technical aspects of the bill such as utilizing geologic structures to define special ground waters. This is an inappropriate basis for ground water quality management and should be left to EPA guidance.

Q9. To what extend should the federal government concern itself with ground water depletion?--Research only? Regulation?

EPA does not address issues related to the availability of ground water, but to its quality. We believe, therefore, that the Department of Interior is in a better position to discuss the future extent of federal involvement in ground-water depletion.

Q10. To what degree are states using land use contols to prevent ground water contamination?

At the state and local level, land use controls in conjunction with source controls, are essential for the protection of ground water quality. Not every source of contamination can or should be requlated as a separate contaminating activity. Land use controls, especially on the local level, can and are being implemented in vulnerable areas, to separate conflicting land use activities and to impose stricter performance standards on existing land use activities. Examples can be identified in practically every state where a land use control has a beneficial ground water quality impact.

- Long Island, New York, effectively implements land use regulations to control septic systems impacts on ground water quality.

- New Jersey provides technical assistance to localities on aquifer characteristics. It has helped communities such as South Brunswick to conduct industrial surveys to identify and regulate, through land use restrictions, potential sources of ground water contamination.

- Minnesota is underlain with extensive Karst (limestone) deposits. The State has encouraged multi-county activities in the siting of septic systems and new private and public wells.

- Florida has used state-wide regulatory authority to ban the location of certain activities (including landfills) in recharge areas to public water supply wells.
- Maine is currently working with municipal governments on zoning changes to protect the water in its sand and gravel aquifers.
- Vermont calculated and mapped the recharge areas to all the public water supplies in the State which has led to the adoption of zoning overlay districts for aquifer protection on the local level.

However, land use controls are not being used very extensively. We believe that as states further develop comprehensive ground water protection strategies, land use controls will grow to become a major approach to ground water protection.

Q11. Given the limited fiscal resources what are the priority programs and activities to fund in these bills?

Given the current budgetary situation, we do not believe that this is the time to enact new programs which call for increased federal resources. However, we think that states and local governments should proceed with protective planning and their ground-water classification systems, e.g. development of land use controls to protect aquifers as described in the answer to question 10.

Q12. Please point out any exemplary state ground-water programs.

Exemplary state ground-water programs would be those programs which include activities to:

- have ground water strategic plans for the future;
- implement classification systems;
- integrate ground water and surface water regulatory activities;
- control sources over and above those covered by federal law, as appropriate; and
- protect current and significant future wellfields through wellhead protection programs.

In addition, exemplary states are those applying resources to enforcement, to education of the public and to implementation of their ground water strategies.

Clearly, several states are further along in implementing these components of successful programs. New York, New Jersey, Minnesota, Florida, Maine and Vermont are such states as well as California, Connecticut, Wisconsin and Massachusetts.

- New York has used its strong statutory framework to structure a ground water protection program that is implemented through the state, regional and local level.

- New Jersey has used its water withdrawal permitting authority to effectively integrate surface and ground water protection efforts by controlling where and how much groundwater can be withdrawn. By this regulatory effort, the quality of public water wells is protected.

- Minnesota has used its research on the Karst (limestone) areas of the state to adopt county ordinances to control livestock wastes (from animal feedlots and manure storage areas).

- Florida has implemented an aquifer recharge area protection program in Dade County. Implementation tools include: performance standards, siting controls and transfer of development rights to protect wellhead areas.

- Maine has led the nation in many aspects of underground storage tank controls for ground-water protection.

- Vermont has developed a strong technical assistance program to assist local governments implement source and area specific controls guided by the states' policy on ground-water protection.

Further analysis of state and local ground-water protection efforts are presented in an excellent 1986 report by the National Research Council entitled "Ground Water Quality Protection, State and Local Strategies". EPA's Office of Ground-Water Protection and Office of Research and Development requested and supported this study to identify and make available information on exemplary state and local ground-water protection programs.

This concludes my answers to your specific questions. I would like to mention that, in connection with the Subcommittees' examination of H.R. 791 and S. 1105--since the focus of those bills is research--it might be useful for you to review a report which was recently released by the OMB Interagency Task Force on Ground Water. This report, "A Description of Major Federal Scientific and Technical Ground-Water Programs, Fiscal Year 1987", concerns ground-water research on the federal level, and I would be happy to submit it for the record.

The Administration, in its floor statement on H.R. 791, stated its position that the research bill is unnecessary, and that it duplicates existing authorities and programs. I believe that, when you read the report of the Interagency Task Force on Ground Water, this assertion will be borne out.

This concludes my prepared statement. I would be happy to respond to any questions which you may have at this time.

United States
Environmental Protection
Agency

External Affairs (A-100AE)
Washington DC 20460

EPA

Legislative Analysis

The Honorable Quentin N. Burdick
Chairman, Committee on
Environment and Public Works
United States Senate
Washington, D.C. 20510-6175

Dear Chairman Burdick:

Enclosed, for insertion in the hearing record, are EPA's responses to questions which you forwarded to EPA following the February 23, 1988 hearing on ground water.

Please feel free to contact us if we can be of any further assistance.

Sincerely,

A. Henry Schilling
Director
Office of Legislative Analysis

ANSWERS TO QUESTIONS ASKED BY SENATOR BURDICK

Question 1:

Indian Tribes are essential participants in the Nation's effort to address ground water planning, and protection, and Congress has said as much in the Clean Water Act of 1987, sec. 518 (33 U.S.C. 1377), and in the Safe Drinking Water Act, sec. 1451 (42 U.S.C. 300j-10). What is the role of the tribes under the bills you are addressing here today and how would tribal water rights be affected, if at all, by these bills?

Answer 1:

Neither S. 1105 nor S. 20 specifically mention American Indians; therefore, neither bill explicitly provides a role for the Tribes. H.R. 791, however, includes "federally recognized Indian tribes" in its definition of "State"; therefore, in this bill, Indian tribes would be involved in the consultations, the research, and the assessments to the same extent as States. Furthermore, Indian tribes would be eligible to enter into contracts or cooperative agreements, or to receive grants, whenever States are so authorized.

S. 1105 and H.R. 791 would primarily authorize federal research, development and technical assistance activities, and as such, would not affect American Indian tribal water rights.

S. 20, on its face, gives the States jurisdiction to administer ground-water protection programs on all lands within the State. This would include lands within Indian reservations. State jurisdiction (under sec. 9 of S. 20) would extend to programs under the Safe Drinking Water Act (SDWA) and Clean Water Act (CWA) which relate to ground-water protection.

However, in 1986, Congress amended the SDWA to authorize the Administrator of EPA to treat eligible Indian tribes as States (i.e., tribes which meet specified statutory conditions) and allow such tribes to administer (i.e., give them primary enforcement authority over) SDWA programs on Indian reservations and arguably within "Indian country", as defined in 18 U.S.C. 1151 at large. In addition to being able to apply for primary enforcement authority, tribes can also apply for program development grants. Three of the four SDWA programs--Underground Injection Control, Wellhead Protection, and Sole Source Aquifer Demonstration--concern ground-water protection. In 1987 a very similar Indian amendment to the CWA was enacted. Under this amendment, eligible Indian tribes can receive primary enforcement authority over the major CWA programs and thereby administer these programs within Indian reservation.

In sum, enactment of S. 20 would give States jurisdiction over ground-water protection matters (including aspects of ground-water protection covered by Safe Drinking Water Act and Clean Water Act programs) with respect to all lands--including Indian lands--within a State. Yet, the Indian amendments to the SDWA and the CWA were designed to authorize eligible Indian tribes to administer SDWA and CWA programs concerning ground-water protection within their reservations. Thus, S. 20 and the "Indian tribe" amendments to the SDWA and CWA appear to be diametrically opposed.

Question 2:

What funding does EPA provide to tribes to carry out their responsibilities under the Clean Water Act and Safe Drinking Water Act?

Answer 2:

Under the Safe Drinking Water Act, EPA expects to make available about $600 thousand in the Underground Injection Control program and about $1 million in the Public Water Systems program to Indian Tribes in FY 1988. Prior to providing such funding, EPA must complete the rule for the Indian Tribe participation in the programs. This rule will likely be promulgated in the next few months.

Under the Clean Water Act, EPA expects to make available about $11.5 million in construction grants and $913 thousand in section 106 grants to Indian Tribes in FY 1988. However, prior to releasing the section 106 funding, EPA must also complete the rule for Indian Tribe participation under the Act. This rule will likely be promulgated this summer.

EPA's Response to Senator Baucus' Question at the February 23, 1988 Hearing on Ground Water

Some States have taken more steps to protect their ground water primarily because of the extent of ground water contamination observed in the state and the extent of the State's dependency on ground water for its drinking water supply. Generally those States with the most significant problems have taken the most aggressive steps to protect and clean up ground water.

The momentum for action to protect ground water is clearly wth the States. As we have stated in the written testimony in an answer to the Committee's question number twelve, some States are further along than other States in both developing and implementing State-wide protection strategies, including California, Connecticut, Florida, Maine, Minnesota, Massachusetts, New Jersey, New York, Vermont and Wisconsin. There were several other States like Arizona, Colorado and Kansas that were also cited for exceptional protection activities in a 1986 report by the National Research Council of the National Academy of Sciences entitled "Ground Water Quality Protection, State and Local Strategies," which was supported by EPA to promote exemplary programs. A good portion of the work in the States has been funded by them, although EPA has provided about $26 million in Clean Water Act funds to assist in their efforts.

All States have either completed or are completing strategies for State-wide ground water protection. For example, thirty-three States have adopted their own classification systems recognizing that differential protection is a logical and efficient way of managing ground water quality. States are developing plans to implement Underground Storage Tank programs, and cooperating with EPA in Superfund cleanups and FIFRA enforcement actions. Many states have assumed responsibility for the Underground Injection Control and Hazardous Waste Programs and where they have not, EPA manages them in their place. States have also set controls on some contaminating sources beyond those mandated by federal law and are upgrading their monitoring and data management capabilities. Further, many States are beginning to develop wellhead protection programs to provide special protection to areas around public water wells.

The attached report summarizes EPA's program efforts EPA to assist States in developing comprehensive strategies for ground water protection. These strategies will assist both EPA and the States implement both federally mandated programs and make resource management information available to them. It also summarizes which States are developing and implementing their ground water protection strategies and the kind of EPA support provided to carry out this effort.

Status Report
EPA/State Activity in Ground Water Protection
Prepared for
Committee On Environment and Public Works
Subcommittee on Water Resources, Transportation and Infrastructure
and
Subcommittee on Hazardous Waste and Toxic Substances
United States Senate

Office of Ground-Water Protection
Office of Water, EPA
June 2, 1988

STATUS REPORT

EPA/STATE ACTIVITY IN GROUND-WATER PROTECTION

I. EPA LEADERSHIP

To assist all of the States, EPA has provided financial, capacity-building and numerous other activities of assistance to States in implementing Federal programs (i.e. Superfund, RCRA, FIFRA and UST), and in initiating further state efforts, i.e., State Strategy grants through the Clean Water Act Section 106. We have also worked with the National Research Council to identify excellent state strategies and distribute them to other states.

State Capacity-Building

In order to help states pull together all federal and state related ground water efforts, EPA has awarded slightly over $27 million dollars over the FY 85-88 period. This has been used by states to develop and implement state-wide comprehensive strategies. These funds are provided under the authority of section 106 of the Clean Water Act.

Furthermore, EPA has and continues to provide technical assistance and hold seminars and conferences for State and local officials. For example, EPA will assist States in planning for Wellhead Protection programs through technical assistance on such topics as: a risk-based approach for wellhead protection management; delineation of complex hydrogeological settings; local financing options for wellhead protection programs; and planning for providing water supply and protecting the aquifer during a contamination emergency. EPA's Regional Ground Water Representatives work closely with each State to assist them in coordinating and integrating ground water protection activities within their institutions. A series of regional workshops for State officials are being held on the technical aspects of wellhead delineation and a national conference on wellhead protection is being planned for later in 1988

Superfund

The Superfund program is of major assistance to states in cleaning up ground water contaminants. To increase the efficiency with which EPA implements this program, and to assure State input to EPA, the Agency publishes numerous guidance documents which assist the States in understanding EPA decisions and processes and in implementating remedial actions. For example, EPA will soon publish guidance regarding how we consider State laws in making remediation decisions. Another example is guidance which will assist the EPA Regions, in cooperation with the States, select remedies for certain Superfund sites.

RCRA

The States are integrally involved with implementation of the RCRA hazardous waste program. The Agency has a wide variety of activities that are designed to help the states develop and maintain hazardous waste programs that among other things protect ground water from the mismanagement of hazardous waste. In short, the Agency has developed or is developing the regulatory framework for states and also provides a grants program to help assure that States develop credible hazardous waste programs.

Agricultural Chemicals in Ground Water Strategy

EPA recently published for public comment, an "Agricultural Chemicals in Ground Water Strategy" which proposes that States assume a greater role in protecting ground water from agricultural chemicals contamination. This proposal urges states to develop and implement ground water management plans. This EPA initiative is designed to further State and local involvement in solving ground water contamination problems caused by pesticides which are a source of contamination of national concern.

Underground Storage Tank Program

The Underground Storage Tank program is being implemented by the States with support provided by EPA. EPA is developing a regulatory and policy framework which will be the basis for delegation of the program to the States. In addition, EPA provides program grants for program development and cooperative agreements under the LUST Trust Fund for cleanup of UST leaks, including ground water cleanup.

Settings Standards

EPA also provides assistance to states in protecting ground water by setting maximum contaminant levels. These standards are used by states as reference points for ground water protection and cleanup. Eighty-three standards for drinking water contaminants will be set by 1989 as required by the Safe Drinking Water Act. EPA also produces health advisories regarding ground water contaminants. As a recent example of health advisories, EPA has developed new health advisory levels for about 60 pesticides that have the greatest potential to leach into ground water.

Risk Information

To provide ready access to health risk information, EPA has developed a computer based system, referred to as the Integrated Risk Information Systems (IRIS), that is a compendium of the most current health data on carcinogens and the threshold values of certain toxicants. IRIS also includes Drinking Water Health Advisories and data on MCLs and maximum contaminant level goals. IRIS is an important step in consolidating risk information in a vehicle that will be readily accessible to States.

Research and Development

States look to several agencies, including EPA, for research and development on ground water. EPA disseminates to states the results of our research on monitoring, fate and transport, aquifer restoration, source controls and health effects, and has recently initiated a new Technology Transfer Office to increase and facilitate this effort.

National Surveys

The Agency has undertaken and continues to conduct national surveys of sources of contamination which both serves its regulatory programs, but also helps states have a better understanding of various problem areas. For example, in 1983, EPA conducted a national survey of volatile organic compounds in drinking water wells. Currently, EPA is conducting a National Pesticides in Well Water Survey to assess the extent to which pesticides and nitrates are occurring in drinking water wells.

Data Systems

EPA has and will continue to assist the States to develop ground water data systems and to make existing data more accessible. For example, this year, EPA will adjust its primary water data system, STORET, to make it more accessible to environmental managers. Also, EPA will put together a document on indicators of ground water quality so EPA and the States can use existing data systems to measure trends and status of ground water quality and protection program results. EPA is also working within the Agency and with other agencies to develop a minimum data set that would be voluntarily used by agencies wishing to make their data more compatible with other ground water data.

II. ACTION BY THE STATES AND STATE SPECIFIC EPA ACTIVITIES

All States are moving forward with implementing ground water protection activities. Attached is a brief description, for each State, of some of the state activities on ground water and some of EPA's activities to assist the states. The primary focus of this description is on state and EPA activities under the Clean Water Act, with Section 106 grants for State Ground-Water Protection Strategy development and implementation. There are also some brief descriptions of some other state activities, such as a description of several specific state statutes.

ALABAMA

Ground-Water Strategy: Alabama developed a draft strategy in FY 88 The State is currently revising and updating the draft strategy, with completion expected in FY88.

Protection Activities: The State has not enacted explicit ground-water legislation, but bills are being introduced in the State legislature which would authorize Underground Storage Tank and Wellhead Protection programs. The State has also proposed support of limited Wellhead Protection activities in several counties with vulnerable water supply systems.

EPA Assistance: EPA provided Section 106 grant monies for FY 85-88 of about $604,000. The Region provides the State with technical assistance documents relevant to ground-water activities. The Region also sponsors annual meetings with State ground-water program directors and conducts/participates in meetings/conferences which include classification, wellhead protection, data management, GIS application and for the National Pesticides Survey.

ALASKA

Ground-Water Strategy: The State's strategy is in the early stages of development and is expected to be complete at the end of FY88.

Protection Activities: The State has shown interest in Wellhead Protection programs. The State also has standards for both surface and ground waters, which reflects integration of surface and ground water.

EPA Assistance: EPA provided section 106 grant monies for FY 85-88 of about $281,000.

ARIZONA

Ground-Water Strategy: Some delays in strategy development have occurred because of recent passage of the State Environmental Quality Act, which mandates reorganization of ground-water protection responsibilities among various State agencies. The strategy is expected to be completed in FY88.

Protection Activities: The State's ground-water protection authority is derived from the recently passed State Environmental Quality Act (EQA). This establishes authority for ground-water protection, including an aquifer protection permitting program, adoption of aquifer quality standards, definition of aquifer boundaries and classification procedures. The Ground Water Management Act of 1980 provides for Active Management Areas, or geographic areas where ground water supplies are endangered and where ground-water use would become more stringently regulated.

EPA Assistance: EPA provided about $437,000 in Section 106 grant funds from FY85-88. Also, EPA holds an annual symposium on ground water issues for the States in Region IX and provides technical assistance to the States.

ARKANSAS

Ground-Water Strategy: The State completed its strategy in the early 1980's.

Protection Activities: The State derives its authority to protect ground water from the Arkansas Water and Air Pollution Control Act, which gives broad protection to "Waters of the State." This permits monitoring, classifying, and regulating of both ground and surface waters. The State adopted a classification system, similar to EPA's differential protection policy.

EPA Assistance: Since 1985, EPA has provided about $404,000 in Section 106 grant funds. Other technical assistance includes facilitation of technology transfer to the State via EPA guidance, and training opportunities.

CALIFORNIA

Ground-Water Strategy: The State's strategy was approved by EPA in February 1988.

Protection Activities: The Porter-Cologne Water Quality Control Act of 1979 protects both ground and surface water from contamination. In addition, Proposition 65 limits the discharge of carcinogens and reproductive toxins to drinking water sources. The State is in the process of developing guidance for establishing beneficial uses and ground water standards.

EPA Assistance: EPA provided about $917,000 in Section 106 grants for the FY85-88 period. Also, EPA holds an annual symposium on ground water issues for the States in Region IX and provides technical assistance to the state.

COLORADO

Ground-Water Strategy: The State's strategy and policy goals were adopted in 1984, and an update is being encouraged by the Region.

Protection Activities: In 1987, the State adopted regulations establishing a classification and standards system. Enforcement and control regulations are currently being developed, as well as additional standards for organic contaminants in ground water.

EPA Assistance: EPA provided about $391,000 in section 106 grants for the FY85-88 period. Also, EPA and USGS are assisting the State in developing a GIS data base. EPA and USGS have also participated in a wellhead protection area delineation pilot project.

CONNECTICUT

Ground-Water Strategy: The State's Ground-Water Protection Strategy was updated early in 1987 and the revisions are scheduled for completion by the end of FY 88.

Protection Activities: The State derives its ground water protection activities from several laws and programs, including Connecticut's Clean Water Act of 1967 which addresses permits for discharging into the ground. The State also adopted standards and a classification system covering discharge permits. It also utilizes programs which control sources of contamination, provides local assistance, and requires basin-wide water resource plans.

EPA Assistance: EPA provided Section 106 grant monies of about $412,000 to the State over the FY 85-88 period.

DELAWARE

Ground-Water Strategy: The State's strategy was completed in February 1988.

Protection Activities: The State is developing a Wellhead Protection Program (with EPA funding). Separate from surface water, ground water policies are being refined to account for remediation and contamination sites.

EPA Assistance: EPA will have provided about $416,000 in Section 106 grants for FY85-88 period.

DISTRICT OF COLUMBIA

Ground-Water Strategy: DC's draft strategy was completed in June of 1987.

Protection Activities: The District's strategy includes legislative proposals in monitoring and source controls, classification, wellhead protection and surface water/ground water policy integration.

EPA Assistance: EPA will have provided about $264,000 in Section 106 grant funds for the FY85-88 period.

FLORIDA

Ground-Water Strategy: The State has a comprehensive ground-water program that is addressed by State Functional and Operational Plans. The State is developing a ground-water strategy which formalizes a ground-water protection approach in a single document, due to be finished in FY 1988.

Protection Activities: Current State legislation, which addresses ground-water quality, public health, and data management, includes the Water Quality Assurance Act and the Florida Air and Water Pollution Control Act. The State has a 4-tiered classification system of differential protection, with 2 zones of protection for major municipal wells under the wellhead protection (G-I) Rule. Additionally, 3 counties have wellhead protection programs, with other counties also considering development of such programs.

EPA Assistance: EPA provided Section 106 grant monies of about $594,000 for the FY 85-88 period to support state activities, especially wellhead protection (G-I) mapping. In addition to providing technical assistance, the Region sponsors meetings/conferences/seminars on classification, Wellhead Protection programs, the National Pesticide Survey and application of Geographic Information System activities.

GEORGIA

Ground-Water Strategy: Due to new ground-water initiatives, the State is preparing to update their Ground-Water Management Plan which was completed in 1986.

Protection Activities: The State has several existing environmental statutes, including the Water Quality Control Act, the Safe Drinking Water Act, and the Ground-Water Use Act. The State is implementing a systems management approach using permitting activities. The State ground-water protection program also involves the identification of areas susceptible to pollution under a Recharge/Discharge Area Protection Plan. The State puts emphasis on ambient monitoring, recharge area protection, data management and Geographic Information System activities.

EPA Assistance: EPA provided about $685,000 in Section 106 funds for the FY85-88 period. Other technical assistance includes seminars/meetings/conferences on such topics as: Wellhead Protection, classification, National Pesticide Survey, data management, and Sole Source Aquifer designations.

HAWAII
Ground-Water Strategy: The State has an approved ground-water strategy.

Protection Activities: The State enacted an appropriation for a ground-water protection program. This act provides resources to implement the ground-water monitoring strategy, to continue baseline ground-water monitoring and to conduct health risk assessments. The State will also fund public hearings and workshops to obtain public support for the strategy.

EPA Assistance: EPA provided about $401,000 in Section 106 grant funds for the FY85-88 period. Also, EPA holds an annual symposium for the States in Region IX and provides technical assistance to the State.

IDAHO
Ground-Water Strategy: The State has had a strategy since 1983 which focused mainly on programs administered by the State Department of Health and Welfare, with emphasis on source controls. The State plans to revise the strategy to address inter-agency programs.

Protection Activities: The State relies on general water statutes for ground water protection. Standards for both surface and ground water are covered under these statutes. The State is proposing a three-tiered classification system. Also, a State Wellhead Protection program received funding from recent legislation.

EPA Assistance: EPA provided about $445,000 in FY85-88 grant monies.

ILLINOIS
Ground-Water Strategy: The State completed its ground water strategy in January 1986. It is fully approved and being implemented.

Protection Activities: The Illinois Ground Water Protection Act was passed, enacted and provides for comprehensive protection including a Wellhead Protection program. A State project was completed in FY87 to assess the roles of local government and regional planning agencies relevant to Wellhead Protection programs.

EPA Assistance: Approximately $644,000 in Section 106 funds were awarded in the FY85-88 period. Technical assistance includes a wellhead seminar, DRASTIC methodology instruction, and documents on the Sole Source Aquifer program, wellhead protection, and agricultural chemicals.

INDIANA

Ground-Water Strategy: The State strategy has been accepted as final. The implementation plan for FY88 also has been approved.

Protection Activities: An interagency committee is in place to develop ground water standards which will be integrated with current surface water policies. Other activities include a 1987 study identifying priority ground water areas in the State, a pilot wellhead protection area study and identification of vulnerable public water supplies.

EPA Assistance: Approximately $651,000 in Section 106 funds were awarded in the FY85-88 period. EPA helped the State's Department of Environmental Management ground water section to obtain half of the State's 205(j) Nonpoint Source funds. Technical assistance from EPA includes DRASTIC and Wellhead Protection seminars, a Grand Calumet River Study, and technical documentation.

IOWA

Ground-Water Strategy: Following passage of State ground water legislation in 1985, the Iowa Department of Natural Resources developed and adopted a final strategy. The 1985 law forms the basis of the Iowa strategy.

Protection Activities: The 1985, "Iowa Groundwater Protection Act," includes fees on: solid waste disposal facilities, agricultural chemical and fertilizer dealers/ manufacturers, underground storage tank owners and operators, and household hazardous waste retailers and manufacturers. Statewide public hearings are being held to investigate the desirability of adopting groundwater standards.

EPA Assistance: EPA provided approximately $401,000 in Section 106 grant funds for the FY85-88 period. Additional regional support has included: $550,000 in extramural funds to apply towards the study of fate and transport of agricultural chemicals at Big Spring; $27,000 for alluvial aquifer studies; $226,000 for ground water quality studies; $27,000 for vulnerability mapping; and $366,000 for agricultural drainage well studies.

KANSAS

Ground Water Strategy: The State has developed and adopted a final and fully approved strategy.

Protection Activities: Kansas has an existing ground water classification system, based on state statutes, which is integrated with their surface water classification system . The State could move toward a Wellhead Protection Program since a Wellhead Protection Program bill is pending in the legislature. Development of local Wellhead Protection Programs in some areas through the Groundwater Management Ditricts is also possible.

EPA Assistance: EPA provided about $366,000 in CWA Section 106 grant funds from FY85-88. Other funds include a $25,000 grant for a Wellhead delineation project, and $200,000 in UIC carryover funds to develop Wellhead Protection programs in ground water management disticts.

KENTUCKY

Ground-Water Strategy: Kentucky's ground-water protection strategy, currently in place, includes a proposed classification strategy.

Protection Activities: The State derives its authority for ground-water protection activities from several State statutes: one provides for ground-water and surface quality and quantity responsibilities; and a second provides authority to the State for ground-water protection activities related to underground storage tanks, superfund, and solid and hazardous wastes. In addition to mapping vulnerable public spring systems, the State has proposed limited Wellhead Protection activities.

EPA Assistance: EPA provided about $400,000 in Section 106 grant monies to establish and support ground-water programs. In addition to providing technical assistance, the Region sponsors meetings/conferences/seminars on classification, Wellhead Protection programs, the National Pesticide Survey and application of Geographic Information System activities.

LOUISIANA
Ground-Water Strategy: The State legislature has mandated completion of the State strategy by June 30, 1988. The framework for the State's strategy is built upon a report entitled "Groundwater Protection in Louisiana: Problems and Options." This report was written by a Groundwater Advisory Group chaired by the Secretary of the Louisiana Department of Environmental Quality.

Protection Activities: The State Water Control Law regulates activities resulting in the discharge of substances into the waters, and prohibits discharges of hazardous waste into ground water, except relating to Underground Injection Control programs. Protection authority is also dervied from the State Solid Waste Management and Resource Recovery Law, which addresses drinking water wells, regulations for treatment, storage and disposal of hazardous waste, as well as rules and regulations for underground storage tanks. The State also has laws regarding well standards, abandonment procedures, driller licensing, and regulation of oil and gas activities. By law, the five state agencies dealing with ground water issues must integrate. A Wellhead Protection program is currently being developed.

EPA Assistance: EPA provided about $443,000 in Section 106 grant monies for the FY85-88 period.

MARYLAND
Ground-Water Strategy: The State's strategy was completed in 1986.

Protection Activities: The State has a very rudimentary classification system, and Wellhead Protection-type activities are being conducted at the county level.

EPA Assistance: EPA will have provided about $433,000 in Section 106 grant funds for the FY 85-88 period.

MAINE
Ground-Water Strategy: The State, through a Groundwater Standing Committee, is in the process of drafting a strategy, which is scheduled for completion in the summer of 1988.

Protection Activities: Several existing state ordinances (28) offer significant protection to ground water. For FY88, eleven state statutes are being submitted to the legislature, and a water supply and allocation study will be conducted.

EPA Assistance: Between FY85-88, EPA provided the State Section 106 grant monies of about $390,000. The State has submitted a Draft Wellhead Protection Program Plan, in conjunction with a pilot project. This project is funded by the EPA Regional office to study delineation and contamination source inventories.

MASSACHUSETTS

Ground-Water Strategy: A task force composed of representatives from all agencies is currently convening to develop a comprehensive state Ground-Water Protection Strategy.

Protection Activities: There are many peices of legislation in place providing for ground-water protection including such activities as use and transfer, classification, and discharge permits. These include: The Water Management Act, which regulates withdrawals and registration and permitting; Interbasin Transfer Act; The Contamination Correction Program; The Water Conservation Grants; and Ground-Water Classification and Permitting. A State classification system is in place, and a CCAMP Wellhead Protection Pilot Project resulting from a federal/state cooperative initiative is due for release this year.

EPA Assistance: EPA provided Section 106 grant monies of about $553,000 for the FY85-88 period.

MICHIGAN

Ground-Water Strategy: The State Ground Water Protection Intitiatives in 1984 will be modified and updated in FY88 to more closely resemble EPA's strategy requirements.

Protection Activities: The State is actively seeking to integrate the State ground water data base with local health department activities. The State is also working to strengthen its ground water protection permits program.

EPA Assistance: About $689,000 in Section 106 funds were awarded in FY 85-88. Technical assistance includes an Upper Great Lakes Connecting Channels Study (involving USEPA and Canada), and Wellhead Protection and DRASTIC seminars.

MINNESOTA

Ground-Water Strategy: The State's strategy is in draft form with completion expected at the end of FY88.

Protection Activities: The State is implementing an integrated Ground Water Information System to be on line in FY89. The State has also developed a process for delineating priority ground water areas.

EPA Assistance: About $955,000 in Section 106 funds were awarded for the FY 85-88 period. Technical assistance includes Wellhead Protection and DRASTIC seminars, along with technical documents provided by EPA.

MISSISSIPPI

Ground-Water Strategy: The State completed its strategy in FY87.

Protection Activities: The State is in the process of developing elements of a limited wellhead protection program, and may adopt EPA's classification system. The State's water pollution control laws are broad in scope, but recent legislation (1985) clarified and further defined state water policy including ground water issues.

EPA Assistance: EPA provided about $404,000 in CWA Section 106 grant funds from FY85-88. Other technical assistance provided by EPA includes seminars/meetings/conferences on classification, wellhead protection, national pesticide survey, application of Geographic Information Systems and data management.

MISSOURI

Ground-Water Strategy: The State has adopted a final strategy.

Protection Activities: The state is developing an implementation policy for their existing ground water classification system which will acknowledge vulnerability according to place and resource value. Since late 1987, Missouri has submitted two Wellhead Protection workplan drafts for EPA review.

EPA Assistance: EPA provided about $428,000 in Section 106 grant funds from FY85-88. Technical assistance includes conferences held on data management systems, and wellhead protection programs.

MONTANA

Ground-Water Strategy: The Governor's Ground-Water Advisory Council developed and approved a State Ground-Water Strategy in 1985.

Protection Activities: Responsibility for the strategy's implementation is divided among several State agencies. The State is implementing a permit and classification system, as well as funding of resource assessments. Several contracts are currently underway to assess impacts associated with the disposal of domestic waste by on-site treatment systems (septic tanks and drainfields); to collect hydrogeologic data on ground-water areas vulnerable to contamination by agricultural chemicals; and to conduct an aquifer sensitivity/vulnerability study. The Department of Health and Environmental Sciences is also working with Montana State University to develop a public education program on ground water related topics.

EPA Assistance: EPA provided about about $363,000 in section 106 funds for the FY 85-88 period. An additional $10,000 in contract support is being provided to conduct public education programs.

NEBRASKA

Ground-Water Strategy: The State's fully approved strategy was updated in 1987.

Protection Activities: The State currently is developing a Wellhead Protection Program to be implemented statewide. Also, the legislature is considering legislation to develop a monitoring system complete with sampling analyses. Further, a classification system is being implemented.

EPA Assistance: Nebraska has received about $366,000 in Section 106 grant funds for the period FY-85-88.

NEVADA

Ground-Water Strategy: A State strategy has been prepared with components such as permitting (particularly for mining activities) and monitoring of areas where known contamination exists.

Protection Activities: The State water pollution control law protects all state waters including ground waters from contamination.

EPA Assistance: EPA provided about $511,000 in section 106 grants for the FY 85-88 period. Also, EPA holds an annual symposium on ground water issues each year for the states in Region IX and provides technical assistance to the states.

NEW HAMPSHIRE

Ground-Water Strategy: The State Department of Environmental Services (DES) is currently developing a draft strategy, due for finalization in September 1988.

Protection Activities: The State derives much of its current ground water protection authority from a general environmental statute. This statute includes requirements for ground water permits by municipalities and industries, and for use as federal drinking water criteria as the basis for standards. The State is presently considering legislation to establish a classification system, and to develop a wellhead protection pilot project which could be enacted this Spring 1988.

EPA Assistance: The State received about $390,000 in Section 106 funds for the period FY 85-88.

NEW JERSEY

Ground-Water Strategy: The State's protection strategy is under internal state review and is expected to be finalized in the summer of 1988.

Protection Activities: A State Senator has introduced legislation for a $100 million bond issue to provide public water supplies in areas where private wells have been impacted by contamination. The State's ground-water classification system is under public review, before completion later this year. The State Department of Environmental Protection has allocated monies from a new Clean Water Bond Act to develop a Wellhead Protection program.

EPA Assistance: The State received about $758,000 in section 106 grant monies since FY85. EPA provides technical assistance to local agencies in Wellhead Protection, septic tank management, ground-water data management, agricultural chemical use and impacts, and mitigation of potentially contaminating activities, and training on fate and transport of contaminants.

NEW MEXICO

Ground-Water Strategy: The State will submit a final strategy by September of 1988.

Protection Activities: Some of the State's legislative authority for protection activities includes: the Water Quality Act, the Hazardous Waste Act; the Emergency Management Act; the Environmental Improvement Act; the Public Nuisance Statute; the Geothermal Resources Conservation Act, and the Pesticide Control Act. The State has adopted a two-tiered classification system.

EPA Assistance: EPA provided about $403,000 in Section 106 grant funds for the FY85-88 period. Technical assistance includes training and state/EPA meetings to explore new perspectives and ideas.

NEW YORK

Ground-Water Strategy: The State's Upstate and Long Island Strategies are complete and fully approved.

Protection Activites: New York has an incompatible use law, which prohibits certain potentially contaminating activities in existing Sole Source Aquifer areas. However, money has not been appropriated for developing the regulations to implement the law. The State also has its own principal and primary aquifer designation system for water supply and other planning purposes. The State is developing a statewide Wellhead Protection Program, which they intend to submit to EPA by the June 1989 deadline.

New York (contd.)

EPA Assistance: The State has been awarded approximately $1.173 million in section 106 grants for the FY 85-88 period. EPA also provides technical assistance to local agencies in wellhead protection, septic tank management, ground-water data managment, agricultural chemical use and impacts, mitigation of potentially contaminating activities, and training on fate and transport of contaminants.

NORTH CAROLINA

Ground-Water Strategy: Finalization of North Carolina's 1987 draft strategy is expected in FY88.

Protection Activities: State authority is derived from the North Carolina Water and Air Resources Act, including provisions for ground-water standards, classifying ground water, and permitting contaminant sources. The State also employs a classification system with 5 classes, based on quality and depth. Contamination site inventories and incident response-management procedures are also in place.

EPA Assistance: EPA provided $687,000 in Section 106 grant monies for the FY 85-88 period. In addition to providing technical assistance, the Region sponsors meetings/conferences/seminars on classification, wellhead protection programs, national pesticide survey and application of Geographic Information Systems.

NORTH DAKOTA

Ground-Water Strategy: The State's strategy is a comprehensive document that includes in-depth analyses of current ground-water quality protection programs and a summary of recommended legislative and program changes. A public comment period has been completed. Public comments are currently being incorporated into the document.

Protection Activities: A proposal to amend the State's current water quality standards to include MCL-based standards for ground-water and a two-tiered classification system is currently being discussed in the State legislature. A data management program on nitrates in ground-water is underway to identify potential sources and priority concerns. The State is also conducting a Ground-Water Quality Symposium and plans to focus on activities relating to public eduction.

EPA Assistance: EPA provided about $386,000 in section 106 funds for the FY 85-88 period.

OHIO
Ground-Water Strategy: Ohio's 1986 Strategy is undergoing assessment for updating.

Protection Activities: Wellhead protection legislation is scheduled to be introduced in the State legislature. The State classification system is slated for completion within FY88, with an option for selecting ground water standards. Two Sole Source Aquifer designations exist, and more are planned.

EPA Assistance: The State received about $423,000 in Section 106 funds in the FY85-88 period.

OKLAHOMA
Ground-Water Strategy: An initial draft of the state ground water protection strategy is currently under review by the state agencies, with completion expected in September 1988.

Protection Activities: State legislation provides responsibilities among several state agencies for ground water protection. The State has a classification system which is based on beneficial use categories which have been applied to 21 aquifers. Additionally, numerical standards for organics in ground water have been adopted and development for inorganic standards is underway.

EPA Assistance: EPA provided about $390,000 in Section 106 grant funds for the FY85-88 period. Other technical assistance includes meetings/seminars/conferences on data management, Geographic Information System application, classification and wellhead protection programs.

OREGON
Ground-Water Strategy: The state is currently expanding its policy and a comprehensive implementation strategy will be completed during FY88.

Protection Activities: Since surface and ground water are considered "Waters of the State", they are coordinated under the same general statute. Oregon has proposed a three-tiered classification system, and is working to incorporate ground-water standards into the strategy. A large wellfield for the Portland area is being protected via local effort and planning.

EPA Assistance: EPA provided about $409,000 for the FY 85-88 period.

PENNSYLVANIA

Ground-Water Strategy: The State currently has a draft strategy in place. A final strategy is scheduled for completion late in 1988.

Protection Activities: The State is currently developing management policies and a ground-water classification program.

EPA Assistance: EPA has provided about $861,000 in section 106 funds for the FY 85-88 period.

RHODE ISLAND

Ground-Water Strategy: The State Department of Environmental Management Ground-Water Section is currently revising and restructuring their strategy, with completion expected during the second quarter of 1988.

Protection Activities: The State derives its ground-water protection authority from the Ground-Water Protection Act of 1985, which affords protection comparable to surface water, outlines classification classes, and authorizes statewide protection studies. A Classification system has been developed, but not yet implemented. There are also two wellhead protection pilot projects being developed.

EPA Assistance: In addition to technical assistance, EPA provided Section 106 grant monies of about $390,000 for the FY 85-88 period.

SOUTH CAROLINA

Ground-Water Strategy: South Carolina completed its Strategy in 1987.

Protection Activities: The State employs a 3-tiered classification system based on highest potential use, along with an on-going contamination survey. The State derives its ground-water protection authority from the South Carolina Pollution Control Act. This provides authority for other regulatory efforts, such as underground storage tanks, underground injection control, and well standards.

EPA Assistance: EPA provided for FY 85-88 Section 106 grant monies of about $490,000. In addition to providing technical assistance, the Region sponsors meetings/conferences/seminars on classification, wellhead protection programs, National Pesticide Survey and application of Geographic Information Systems.

SOUTH DAKOTA

Ground-Water Strategy: The State's strategy was adopted in 1987. The Strategy is focused on mapping wellhead areas, consideration of classification and standards, and data management and monitoring needs.

Protection Activities: The strategy is focused on mapping wellhead areas, consideration of classification and standards, and data management and monitoring needs. In late 1987 the State adopted regulations establishing a ground-water discharge permit system and water quality standards. Technical assistance is also being provided to water conservation districts and communities interested in establishing a wellhead protection program. A bill is before the legislature to establish a State Wellhead Protection program and fund research activities. Two bills establishing funds to conduct remedial activities at abandoned petroleum and agricultural chemical contamination sites have been passed by the legislature. The legislature is also funding a pilot study to assess potential impacts of the application of agricultural chemicals.

EPA Assistance: EPA provided about $386,000 in section 106 grant funds for the FY 85-88 period.

TENNESSEE

Ground-Water Strategy: Tennessee completed a draft strategy early in 1988, with completion to follow public hearings in 1988.

Protection Activities: The State derives its ground-water protection authority from the Tennessee Water Quality Control Act of 1977, which establishes broad water quality and public health goals. Along with limited wellhead protection activities, the State is in the process of developing its classification system.

EPA Assistance: EPA provided FY 85-88 Section 106 grant monies of about $462,000. In addition to providing technical assistance, the Region sponsors meetings/conferences/seminars on classification, wellhead protection activities, the National Pesticide Survey and application of Geographic Information Systems.

TEXAS

Ground-Water Strategy: The State's FY87 strategy was submitted to EPA for review and comment. The strategy builds on the concept of nondegradation, and stresses the need for local/regional agencies to share the responsibility for managing protection programs.

Protection Activities: The Texas Water Commission is the primary responsible agency for administering water quality protection programs (both surface and ground water.) The Texas Water Code provides authority for managing and protecting "Waters in the State" which include ground waters. An informal classification system has been utilized by Texas regulatory agencies for years in seeking to implement the goal of nondegradation of usable quality ground-water resources. During FY88, the Texas Groundwater Protection Committee plans to increase consideration given to issues related to classification. To date, the Texas Water Commission and the Texas Department of Health share joint responsibility as lead agencies for wellhead protection programs. Wellhead demonstration projects are currently underway, and are slated to continue during FY88.

EPA Assistance: EPA provided more than $840,000 in Section 106 grant funds from FY85-88. Technical assistance provided by EPA includes both administrative and programmatic support, training opportunities, technology transfer, and interstate discussion of specific technical and/or program implementation difficulties.

UTAH

Ground-Water Strategy: Utah's strategy is fully developed, and the subject of public meetings throughout the state. The structural organization and program elements defined in the strategy have been developed.

Protection Activities: A proposal for a classification system and standards is currently the topic of several meetings with State agencies, the general public, and interested parties. Two cooperative agreements have been signed between the Department of Health and USGS. The State legislature has authorized further funding to support protection activities.

EPA Assistance: EPA provided section 106 grants funds of about $386,000 for the FY 85-88 period.

VERMONT

Ground-Water Strategy: Through a coordinating committee, the State is currently reviewing their 1982 strategy. Revised strategy to be completed in early FY89.

Protection Activities: The state recently passed legislation creating a classification system based on risk to the resource. Implementation rules for this legislation are still being developed. The Health Department is the lead agency for wellhead protection program development, and they have already incorporated many of the concepts of wellhead protection into their programs. The state is also doing aquifer mapping and ground-water classification, and special studies on radon and nitrates in groundwater.

EPA Assistance: EPA provided Section 106 grant monies of $390,000 for the FY85-88 period.

VIRGINIA

Ground-Water Strategy: Virginia's strategy was finalized in 1987.

Protection Activities: The State is revising its ground-water standards. Wellhead protection-type activities are in the county planning and consensus building phase.

EPA Assistance: EPA provided about $572,000 in section 106 grants for the FY 85-88 period.

WASHINGTON

Ground-Water Strategy: The State's strategy is complete and fully approved.

Protection Activities: Memoranda of Understanding and Memoranda of Agreements are being developed to support interagency implementation of the strategy. The State relies on general water statutes, but also has a statute requiring the establishment of local ground-water management areas (15 so far). They also have a statute requiring consideration of ground-water protection in land use planning updates, and legislation which allows local districts to levy a local tax to ensure funding for protection activities (already adopted in the Spokane area). Washington has proposed, but not yet implemented, a three-tiered classification system including sub-classes. The State is interested in establishing local wellhead protection demonstration projects.

EPA Assistance: EPA provided about $485,000 in section 106 grants funds for the FY 85-88 period.

WEST VIRGINIA

Ground-Water Strategy: The State's strategy was completed in 1987.

Protection Activities: Legislation dealing with policy and classification is in the draft stage. Recent legislative amendments authorized the Department of Health to develop wellhead protection activities which are still in the consensus building stage.

EPA Assistance: EPA will have provided about $386,000 in section 106 grant funds for the FY 85-88 period.

WISCONSIN

Ground-Water Strategy: The State has a strong protection program in place, and is in the process of developing a formal ground water strategy.

Protection Activities: The State will add 14 pending ground-water protection standards for agricultural chemicals to the current list. A computer generated ground water susceptibility map of the State with narrative report will be produced in FY88. Draft rules for monitoring well codes are to be adopted in the fall of 1988.

EPA Assistance: EPA provided $740,000 in CWA Section 106 funds for the FY 85-88 period. A Regional wellhead protection program seminar, and DRASTIC seminar were both held in the State.

WYOMING

Ground-Water Strategy: The State does not have a formal strategy. Rather, they have a permit-based program for ground-water protection developed with UIC grant funds, and a detailed program procedures manual that has been completed in draft form.

Protection Activities: A permit-based program for ground-water protection has been implemented since 1982. Key elements of the program include a detailed system for classification, standards, and permits to construct facilities which may impact ground-water quality. A proposal to develop a Wellhead Protection Program for the State was recently submitted to the State by the University of Wyoming.

EPA Assistance: EPA provided about $404,000 in section 106 grant funds for the FY 85-88 period. Another $100,000 of unallocated funds from the CMAG (205 (j)) allotment has been transferred into the section 106 Ground-Water Program.

III. SECTION 106 OF THE CLEAN WATER ACT GROUND WATER GRANT AWARDS ($ IN THOUSANDS)

STATE	FY85	FY86	FY87	FY88	TOTAL
AL	155	155	148	146	604
AK	0	75	112	94	281
AZ	203	105	35	94	437
AR	104	104	99	97	404
CA	300	55	284	278	917
CO	100	96	101	94	391
CT	106	106	101	99	412
DE	0	100	96	220	416
DC	0	57	53	154	264
FL	150	150	144	150	594
GA	176	176	168	165	685
HI	100	95	112	94	401
ID	146	108	97	94	445
IL	130	162	162	190	644
IN	169	169	163	150	651
IA	102	102	100	97	401
KS	100	100	96	70	366
KY	103	103	98	96	400
LA	112	112	114	105	443
MD	112	108	108	105	433
ME	100	100	96	94	390
MA	142	142	136	133	553
MI	132	220	177	160	689
MN	390	246	168	151	955
MS	104	104	99	97	404
MO	117	117	112	82	428
MT	100	96	73	94	363
NE	100	100	96	70	366
NV	117	220	80	94	511
NH	100	100	96	94	390
NJ	0	308	209	241	758
NM	100	96	113	94	403
NY	260	280	311	322	1,173
NC	199	199	99	190	687
ND	100	96	96	94	386
OH	65	0	165	193	423
OK	100	96	100	94	390
OR	135	64	106	104	409
PA	234	224	184	219	861
RI	100	100	96	94	390
SC	126	126	120	118	490
SD	100	96	96	94	386
TN	119	119	113	111	462
TX	200	191	261	188	840
UT	100	96	96	94	386
VT	100	100	96	94	390
VA	149	142	142	139	572
WA	163	70	128	124	485
WV	100	96	96	94	386
WI	271	129	162	178	740
WY	0	196	114	94	404
TOTALS	$6,491	$6,507	$6,427	$6,634	$26,059

TESTIMONY OF
JAMES W. ZIGLAR
ASSISTANT SECRETARY FOR WATER AND SCIENCE
UNITED STATES DEPARTMENT OF THE INTERIOR
BEFORE THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON WATER RESOURCES, TRANSPORTATION, AND INFRASTRUCTURE
AND
SUBCOMMITTEE ON HAZARDOUS WASTES AND TOXIC SUBSTANCES
FEBRUARY 23, 1988

Chairman Moynihan and Chairman Baucus, members of the Committee, it is a pleasure for me to appear before you today to discuss the ground-water legislation currently under consideration in the Congress. Because the Department of the Interior has the largest ground-water research program within the federal government today, the directives contained in S. 20, S. 1105, and H.R. 791 are of great interest to us.

Because of our interest in the Nation's ground-water related programs, we have given a good deal of thought to the underlying principles that ought to guide federal ground-water activities. Before I address the specific questions that you posed for my consideration, I would like to outline what I see as an appropriate role for the federal government in protecting the Nation's ground-water resources.

First and foremost, I believe the federal government must recognize that the primary responsibility for ground-water protection and management lies with State and local governments. This is based on both philosophical and practical considerations. State and local governments always have held the responsibility of managing their ground-water resources for the residents of their communities. I do not believe the federal government should insert itself into that process beyond what present statutes require. Even more basic to this concept, however, is the fact that many of the currently known means of protecting ground water involve land use controls, a role which belongs to State and local governments.

In my view, the Federal mission should be to protect human health and the environment by carrying out the provisions of existing Federal statutes that relate to ground water; conduct research; conduct resource assessments; provide data and information; and provide technical assistance, training, and education for State and local governments for their use in managing ground-water resources and in carrying out the provisions of statutes which delegate Federal responsibilities to them. The long-range goal of Federal scientific programs related to ground-water quality should be to develop a greater understanding of the Nation's ground-water resources, and to provide the needed technical information and capabilities to help State and local governments manage both the quantity and quality of their ground water.

In providing the necessary funding to carry out such a program, we should continue to rely on joint funding agreements between Federal, State and local governments. Our experience with joint funding, through the U. S. Geological Survey (USGS) Federal-State Cooperative Program, has demonstrated that such agreements encourage effective transfer of scientific knowledge and data, provide consistent data upon which to base national ground-water policy, and maintain a spirit of Federal-State partnership related to environmental issues.

As the Nation moves forward to strengthen existing ground-water programs at all levels of government, it is imperative that we ensure that all the interested government agencies maintain the capabilities that are critical to the fulfillment of their statutorily mandated missions. At the same time, we must ensure greater coordination and prevent costly, and perhaps competitive, duplicative programs designed to deal with the same problems. The widely different levels of federal cost shares for nearly identical programs outlined in the three bills you are considering today would produce an atmosphere of "shopping for funding" by State and local agencies rather than bringing about an appropriate marshalling of Federal expertise.

It is widely recognized that the USGS has played the leading role in providing information about the Nation's water resources for the last 100 years. We in the Department of the Interior believe that the USGS has a great deal to offer in helping the Nation achieve the goals I have outlined. Its capabilities in research, data collection, resource assessment, technical assistance, and information dissemination are an asset which should continue to be utilized fully as the Nation seeks to improve the management and protection of its ground-water resources.

Having established that base, I would like now to provide my answers to the subcommittees' questions.

Q1. Is there a need for federal ground-water legislation or are other federal statutes adequately addressing this need (esp. SARA, RCRA, SDWA, CWA)? Would a federal statute weaken other existing federal programs for ground water? What efforts could be made to integrate and strengthen all these statutes?

I see no compelling arguments for any new legislation regarding ground water. The information available to us today clearly is not sufficient to tell us if the approach we are taking with the various statutes and management approaches is too weak, too strong, or about right. To the extent that legislation is limited to providing an appropriate resolution to conflicting directives, I would have no objection to its enactment.

I believe that the three bills we are discussing today are driven by a perception that the set of Federal and State programs now underway is not sufficient to address the problems. Some of the provisions of the bills are predicated on the idea that the States need inducements to undertake the necessary actions to properly manage their ground-water resources. In my view, the States are willing to manage their ground water in a responsible manner and already have taken many significant steps. If there are additional steps that should be taken, at either the State or Federal level, the impediment to taking them is not the lack of will. The real impediments are of two kinds.

The first is a lack of qualified people, analytical tools, and information. This impediment affects the States, the Federal Government, and the private sector. Solving this will take time and effort. University programs, the U. S. Geological Survey (USGS) Federal-State Cooperative Program, and the technical assistance efforts of the Environmental Protection Agency (EPA), the U. S. Department of Agriculture (USDA), the Bureau of Reclamation, and others can certainly help by providing data, research results, and training. The Federal government already has sufficient authority to do these things.

The second impediment is the general lack of knowledge and agreement on what steps ought to be taken. The simple, but wrong, answer would be to severely curtail economic activity that has any potential to pollute ground water. This could have far-reaching and costly impacts on agriculture, domestic waste disposal via septic tanks, most mineral or energy resource extraction, and many other industries. The difficult, but appropriate, answers are ones which strike the right balance between economic considerations and environmental protection. Striking the right balance requires a great deal of knowledge about the occurrence (including temporal trends), sources, transport, fate, and effects of contaminants and about the range of feasible technical solutions. This kind of knowledge can only be developed through serious research and assessment efforts. There are great efficiencies to be gained by conducting at least part of these activities as joint efforts by Federal, State, and local agencies rather than through creation of 50 separate State research programs. Several Federal agencies have unique expertise to apply to these problems. All of them should be participants in the process of carrying out the research. Once again, we already have adequate authority for such programs.

As the Interagency Task Force on Ground Water recently reported to the Congress, there were about $215 million in expenditures for federal scientific and technical programs related to ground water in fiscal year 1987. The USGS is the largest single agency involved in such work. Their fiscal year 1987 program in ground water totaled about $110 million, of which about $20 million was provided by State and local governments. Furthermore, this program has grown and evolved a great deal in the past few years including a rapid growth in activity related to ground water quality. The nature of the scientific and technical programs of all of the agencies are described by topical area in the report prepared by the Interagency Task Force on Ground Water: "A Description of Major Federal Scientific and Technical Ground-Water Programs."

> Q2. Should the primary responsibility for ground-water management reside with State and local governments, or should there be a national goal set by the federal government? If there is to be a national goal, which agency should set it and what should it be? Should there be a strict federal nondegradation policy, a limited one, or should the states decide on nondegradation?

As I stated previously, the management of ground-water resources is a responsibility of the States. This is appropriate because the impacts of ground-water management decisions generally are localized, and only very rarely are there significant interstate impacts. Because ground water flow rates are slow, and flow paths from recharge areas to discharge areas are generally short, it is uncommon for contaminants to move, in the subsurface, across State lines. However, there are some instances where contaminated ground water from one State discharges to a river which then flows into another State, but these instances can be dealt with through traditional methods for addressing interstate surface-water issues. Thus an argument of interstate ground-water contamination provides little justification for Federal regulation.

Secondly, there is no consensus on any particular set of measures, beyond those already required by statutes, that ought to be applied across the board. The choice of approaches to ground water should recognize the vast differences in hydrogeology, ground-water laws, and availability of specific kinds of information about the resource. The consequences of a proposed approach can differ a great deal from State to State or within a State. If there were a relatively mature technology to propose as a solution to a clearly defined set of problems, for example secondary treatment of sewage as in the case of surface-water pollution, then a debate on the validity of mandating its use nationwide would be meaningful. In the case of ground water, there is no such proven technology.

My answer should not be taken to be a sign of complacency about ground-water protection. Rather, I feel there is a great urgency in furthering understanding of the potential threats to ground water and the possible resolution of those threats. This is not the time to insist on a rigid application of any technology or a rigid approach to management. The States are moving vigorously to improve their management of ground-water resources. Over time, by trying a number of different approaches they will help us all find increasingly effective approaches. We in the Federal government should view this as a desirable process: one we should support and from which we all can learn.

As to goals, I believe our goal is one of achieving, to the best of our knowledge and ability, a balance among concerns for health, the environment, and economy. Because ground-water contamination can have lasting effects, this balance should be achieved with a strong concern about the health and welfare of future generations. Requiring that all fresh ground water must be maintained at, or brought up to, a level of quality that poses vanishingly small risks, may impose costs on our society that we simply can't afford. By attempting to achieve very low risk levels at all the sites we address, we may greatly delay our attention to many other sites that pose much higher, long-term risks to society.

The consequence of a non-degradation policy would be a virtual halt to the use of agricultural chemicals, to many industrial activities, and to the use of septic tanks for waste disposal. Our policy should be to focus our limited economic and technical resources on the most serious threats to people's health and to develop the knowledge of the resource and management methods that will result in even better management of ground-water quality in the future.

There should be no Federal policy of non-degradation.

> Q3. Do you support federal ground-water permits based on water quality criteria or federal source controls based upon potential for ground-water contamination? If so, for what sources?

I am not aware of the need for any new category of Federal permits beyond those that exist under current statutes.

> Q4. How should the activities of Federal agencies be coordinated: by a committee designated by statute, a statutorily designated lead agency, or should this be the responsibility of the President? In answering please consider whether there should be one lead agency for research and another for regulation. If there were to be a federal entity to coordinate research among the agencies is there an existing suitable entity (e.g. FCCSET -- The Federal Coordinating Council on Science, Engineering, and Technology)?

Scientific and technical programs related to ground water should be conducted by a number of Federal agencies, and no one agency should be empowered to control the priorities of other agencies. The designation of a single lead agency, or a pair of lead agencies, is inappropriate. There are a host of statutes that define responsibilities of various agencies and the creation of a single "lead" agency would create confusion and perhaps limit the ability of other agencies to achieve their statutorily mandated goals.

Certainly coordination of programs among Federal agencies is important. The Federal Coordinating Council on Science, Engineering, and Technology (FCCSET) committees report directly to the President's Science Advisor, and as such they can have a direct avenue for focusing the attention of the Executive Office of the President on important issues in science and technology. I do not believe that any free-standing committee chaired by one or two of the major agencies would be equally capable of addressing and focusing attention on the key issues in ground water.

The Administration has already undertaken to use FCCSET to improve Federal scientific coordination in ground water. The Committee on Earth Sciences of FCCSET established a subcommittee on ground water at its December 23, 1987 meeting. The subcommittee is chaired by Dr. Robert Corell, Assistant Director of the National Science Foundation. Since the Administration has taken this step to ensure coordination, I do not see the need for legislation to mandate this option.

> Q5. For each of the following functional activities describe the role you see each of the various Federal agencies playing (including the funding and institutional arrangements, where appropriate), regardless of whether you approve of the function itself being carried out by the Federal Government.

Before answering each of the specific sub-question about functional activities I would like to say that the important question is one of mission and not one of function. Each of the agencies has a particular mission with respect to ground water. In order to achieve that mission they need to carry out certain activities in some cases and rely on others in other cases. Coordination is, at least partly, the "art" of deciding when to rely on others and when to build in-house capabilities.

In addressing this question with regard to ground water, the Department of the Interior has worked with EPA to develop an understanding of the appropriate relationship. This was formalized in a Memorandum of Understanding which was signed in June of 1985. I would like to quote some of the key language of that agreement in describing the Department of the Interior's views on mission and activities.

> "With regard to water-quality activities of the EPA and USGS, this memorandum is based on the following premises: (1) USGS is responsible for developing basic scientific information on the ground-water environment through research, investigations, and data collection, including base line information on hydrologic, geochemical, and biologic processes, distribution and composition of water-bearing materials, artificial recharge potential and impacts, and the sources, quantities, qualities, distribution, and behavior of the ground-water resources; these responsibilities derive from the statutory authorities defining the USGS and its mission, including the Organic Act of 1879 and the subsequent annual appropriation acts authorizing USGS programs; and (2) EPA is responsible for carrying out its statutory authority over sources of ground-water contamination. Those authorities cover a wide range of responsibilities which include, for example,...[a list of responsibilities under eight statutes]... Each of these acts seeks to protect ground water at a principal or subsidiary point of vulnerability. As an integral part of its mission, EPA conducts research and other support activities."

The agreement goes on to discuss the relationship between USGS activities and EPA ground water protection activities:

> "The [EPA] Ground-Water Protection Strategy also recognizes the need to incorporate USGS hydrologic expertise and capability in activities relating to ground-water quality protection. Relevant USGS activities related to ground-water quality protection include basic research, areal investigations at the local, regional, and national levels, the collection and analysis of water-quality data in support of research investigations, and technical assistance. Some of these activities are funded entirely through appropriations to the USGS under its Federal Program; others are funded jointly by the USGS and by State or local governments under the USGS's Federal/State Cooperative Program; still others are funded by other Federal agencies."

We are also in the process of developing a Memorandum of Understanding with the USDA to help coordinate our ground-water activities. In answering the multiple parts of this question I will focus on the role of the Department of the Interior.

> Q5a. approving of State plans for assessment, monitoring, protection, or management.

The USGS has a long history of providing advice to States on all aspects of water resources. They should continue to do so. The ability of the USGS to have the positive impact it has had on the programs of State and local agencies has come about by voluntary association through the Federal-State Cooperative Program or through the State or local agency deciding, on its own, to utilize information or methods developed by the USGS. The ability of the USGS to have a positive impact on State and local resource assessment, management, and protection programs comes about as a result of the scientific capabilities of the USGS and not because of a statutorily-mandated approval function. The approval function for the USGS, proposed in S. 20 could significantly erode the positive role that the USGS plays as an impartial scientific agency. The USGS can contribute to achieving the purposes of Sections 6 and 8 of S. 20 in another way.

Using the mechanism of the existing USGS Cooperative Program, the decision to fund a particular activity is based on a determination of the kind of information needed by each State and is jointly arrived at by the USGS and the cooperating State or local agency. These activities include mapping of aquifers, mapping of recharge areas, mapping of well-head protection areas, assessment of aquifer vulnerabilities based on hydrogeologic factors, determination of relative importance of various types of threats to ground water, development of geographic information systems and data bases for use in State-run ground water management programs, and training of State or local agency staff in hydrogeology or in water sample collection procedures.

This kind of tangible assistance to State ground-water managers does not require the laborious process of writing and reviewing national guidance documents for monitoring and assessments. It recognizes that every State is different in terms of hydrogeology, ground-water laws, nature of the major threats to ground water, availability of information, mix of agency responsibilities, and mix of agency capabilities.

> Q5b. providing technical assistance on matters of hydrogeology, resource assessment, resource management, mapping of aquifers or recharge areas, or data management.

As indicated in my response to part (a) all of these are very appropriate functions for the USGS, funded through the Federal-State Cooperative Program. The USGS is a focal point in the Federal government for these kinds of technical assistance.

The Department of the Interior is concerned about proposals with alternative levels of cost sharing. For about 100 years, the Geological Survey has managed the Cooperative Program as a co-equal partnership between the Federal Government and State and local governments. Currently, the Cooperative Program includes about 950 State and local agencies which contribute 50 percent (or more) of the funds. These funds, which in Fiscal Year 1987 totaled about $55 million, are in turn, matched by the Geological Survey which does most of the work in-house.

The Department supports 50/50 cost-sharing for all technical assistance programs. Fifty percent is a sufficiently high Federal share to induce the States to participate in a technical assistance program.

There is more than enough useful work to be done by all of the relevant Federal agencies and State agencies. No one would be served by the creation of several new programs in different agencies which are similar in intent and which provide funding by different rules and at different funding ratios. The result would be State agencies shopping for the best deal and Federal agencies becoming embroiled in turf battles rather than getting down to business.

Q5c. providing technical assistance on matters of health effects, criteria setting, mitigation strategies, or remediation strategies.

Several agencies such as EPA, USDA, HHS, and DOE have major roles in providing technical assistance on these matters. The Department of the Interior also has a role in technical assistance related specifically to mitigation and remediation through programs of the Bureau of Mines, Office of Surface Mining, Bureau of Reclamation, and Geological Survey.

Q5d. operating an information clearinghouse providing indexing of data, of literature (technical and lay), and of sources of expert advice and services to State and local government.

There is a need for the dissemination of relevant information about ground water to a number of groups: the public (especially home-owners with wells and/or septic systems); industries; farmers; local officials involved in land-use decisions; State officials involved in water management, health, or environmental protection; Federal officials; and scientists involved in water-quality studies. Experience from existing water-information clearinghouse functions in the USGS shows that many of those who need the information have difficulty articulating exactly what information they need because of their lack of ground-water specific background. Often, extended discussions between a client and clearinghouse personnel can result in a refinement of the information request so that it can be focused on the proper type of information in the proper form. Thus, the quality of service is enhanced by having a widely distributed network of clearinghouse locations rather than a single national facility.

The USGS has a network of over 250 offices throughout the Nation. These offices serve a clearinghouse function for all manner of water information. Many of them are a part of the National Water Data Exchange (NAWDEX). This consortium of water-related organizations, administered by USGS, operates a network of 75 "assistance centers" (at offices of the USGS and other agencies) which responded to 87,000 referral requests in FY 1987. The USGS also operates the Water Resources Scientific Information Center (WRSIC) which is the primary indexing service for literature on water resources.

Other agencies providing clearinghouse type services include the USDA Cooperative Extension Service, USDA Agricultural Research Service, USDA National

Forest Service, the State Water Resources Research Institutes, existing national information centers funded by EPA, professional societies, and State governments.

> Q5e. conducting research on: hydrology, hydrogeology, fate and transport of chemicals in the subsurface, monitoring-network design, analysis of the vulnerability of ground water to contamination.

The missions of many agencies require the advancement of knowledge about all of these topics. The primary focal point in the Federal government for research on each of these should continue to be the USGS as the primary earth science agency of the Federal government. However, it is appropriate for many other agencies to carry out research in any of these topics as necessary to carry out their missions. Improved interagency coordination will lessen the need for similar research capabilities in several agencies but it should not be expected to eliminate it.

> Q5f. conducting research and development on techniques for preventing contamination from: agriculture, domestic waste disposal, industry (including extractive industries), and other sources.

Several agencies such as EPA, USDA, and DOE have major roles in conducting such research and development. The Department of the Interior also has a role in research and development on techniques for preventing contamination through programs of the Bureau of Mines, Office of Surface Mining, Bureau of Reclamation, and Geological Survey.

> Q5g. conducting research on health and ecological effects of contaminants.

The EPA and HHS have the major roles in conducting health effects research and EPA clearly has major responsibilities related to ecological effects. The Department of the Interior also has a role in research on the ecological effects of contaminants through the programs of the Fish and Wildlife Service.

> Q5h. conducting research and development on methods of remediation and treatment of contaminated ground water.

Several agencies such as EPA, USDA, and DOE have major roles in such research and development. The Department of the Interior also has a role in research and development on techniques for remediation and treatment of contaminated ground water through programs of the Bureau of Mines, Office of Surface Mining, Bureau of Reclamation, and Geological Survey.

Q5i. issuing health advisories.

Issuing of health advisories is not an appropriate role for the Department of the Interior. This is a function which belongs in agencies with a health mission, particularly EPA and HHS.

Q5j. conducting resource assessments.

The Department views the conduct of water resources assessments as an essential aspect of the mission of the USGS. The USGS has been, and should continue to be, the focal point in the Federal Government for the assessment of land, mineral, energy, and water resources. However, it is appropriate for many other agencies to carry out water resource assessments, as necessary to carry out their missions. Improved interagency coordination may lessen the need for assessment efforts by several agencies but it should not be expected to eliminate it because different missions appropriately lead to different approaches to assessment.

Q6. How should the needed university research and educational programs related to ground water be strengthened (e.g. institutes, fellowships, competitive research grant programs) and how should these be administered? The Water Resources Research Act (P.L. 98-242) is authorized through 1989. This Act funds 54 research institutions on a 40/60 federal-state matching basis. How can this program be incorporated into the new ground-water bills?

Any provisions of new legislation regarding institutes or university programs need to address the 54 water resources research institutes already in existence. These institutes have recently been through an extensive evaluation process, mandated by P.L. 98-242, and are authorized through 1989. The results of these evaluations are described in the USGS report "Evaluation of the State Water-Resources Research Institutes." Also, under the authority of P.L. 98-242, the USGS administers an external research grant program covering all aspects of water resources.

Provisions calling for research institutes should not result in the establishment of a new set of institutes that duplicates the mandate of P.L. 98-242. Rather than creating a whole new set of institutes with virtually the same topical focus as the existing institutes, consideration should be given to the full array of academic programs in water resources science and technology. The Department has not formulated its position on the reauthorization of the Water Resources Research Act, but feels strongly that it would be inappropriate to create a function in another agency which duplicates, or is a subset of, that now being carried out in the USGS.

Q7. Comment on the USGS National Water Quality Assessment Program and how that relates to any of the assessments and studies in S. 20, S. 1105, and H.R. 791. Are the time frames for these assessments and studies reasonable?

The USGS National Water Quality Assessment (NAWQA), as proposed, is intended to provide nationally-consistent information on the quality of surface and ground water throughout the Nation, and as such, is a resource assessment. The Department is firmly committed to the idea that resource assessments are important and they fall within the mission of the USGS. The kind of information produced by such long-term assessment programs is essential to provide a baseline for evaluating trends in water quality in the future and measuring the effectiveness of the various programs of water quality management, protection, and remediation. Both H.R. 791 and S. 1105 require specific national-level assessment efforts.

The proposed NAWQA program is expensive and controversial. It is appropriate that we take the time and effort necessary to examine the concept very carefully before making such a long-term commitment. The legislation should not redirect the course of action already established to conduct a pilot NAWQA program, evaluate its potential utility, and then make a decision on full-scale implementation. The USGS is almost 2 years into a pilot phase of testing the design concept. The National Academy of Sciences is conducting an evaluation of the USGS NAWQA concept. They are scheduled to report their findings to the Department by March 31, 1990. A short overview of the NAWQA concept is contained in the USGS report "A Summary of the National Water Quality Assessment Program."

There is also a need for studies that focus on the various known categories of sources of contaminants (as in Sec. 106 of S. 1105). This information is intended for use in a regulatory setting and thus should fall within the realm of EPA, USDA, HHS, and the States. Information on sources is also quite useful for conducting resource assessments.

It should be recognized that the effectiveness of State-by-State studies of the quality of ground water conducted within a period of 18 months (as required by Sec. 6 of S. 20) would be seriously limited by lack of reliable and consistent data, lack of trained personnel, and lack of precedent for such undertakings. The processes of producing any kind of resource assessment which is relevant to the contaminants of concern (such as synthetic organic compounds including pesticides, trace metals, radionuclides, and nitrate) is a difficult one, involving many time-consuming steps. This is true whether it is carried out on a State-by-State basis, on an regional-aquifer basis, or on a contaminant-specific basis. These steps include: cataloging and evaluating existing data, developing an understanding of the relevant hydrogeology, inventorying wells that may be suitable for sampling, developing the sampling plan, training personnel for sampling, taking field samples, analyzing them in a laboratory, entering them into a data base, interpreting the results, and preparing and printing a report. The experience of USGS, EPA, and many State agencies that have undertaken similar efforts is that 4 to 5 years is a more appropriate time frame for producing assessments of significant value.

Currently, in addition to the NAWQA pilot studies, the USGS is involved in a number of valuable assessment-type efforts. These include The National Water Summary, a National Ground Water Atlas, mapping of well-head areas in cooperation with several States, and regional analyses of the occurrence of a few classes of contaminants and their association with land use and hydrogeology. EPA is conducting a national survey of pesticides in drinking water. Thus, significant new information will be available in the next few years.

Most assessment studies are long-term investments. Some require several years simply to learn how to do them well. The considerable disagreement among scientists as to how to carry out ground-water assessments is an indication of the difficulties and uncertainties that such efforts face. This should not be construed as an argument against undertaking serious efforts at assessing the resource or the impacts of various contaminant sources, rather it is an argument against unrealistic time frames and against new programs which might derail, or inappropriately speed-up several promising Federal, State, and local efforts already underway. The legislation should recognize both the need for rapid development of answers to the host of questions that managers have and the need for long-term commitments to steadily increase understanding of the quality of the Nation's ground water.

S. 1105 calls for a "National Ground Water Quality Inventory" report to be completed in 180 days. H.R. 791 has a similar requirement with a 270 day deadline. We believe that reports with such short time frames are unlikely to lead to any significant new insights on ground-water issues beyond what is being developed in a number of other short term efforts already underway. They will simply repackage a number of findings about the status of ground-water quality and about deficiencies in the information base. I do not believe an additional short-term report would be a sufficiently worthwhile undertaking to warrant diverting the agencies' limited staffs and funds from other efforts to build better science and information programs.

Q8. Comment on EPA's classification scheme and how it relates to each of the three bills.

The EPA draft classification scheme represents a major effort on a complex and difficult subject, and it provides a good basis for discussion of many significant issues. The Department supports the concept of differential protection. The level of protection should be based on concerns about the natural quality of the aquifer, the degree of reliance on it for drinking water, the difficulty of finding alternative sources, and the potential for contaminants to migrate within the given aquifer and to other aquifers or surface water bodies.

Q9. To what extent should the federal government concern itself with ground-water depletion? -- research only? regulation?

The depletion of ground water should be viewed as a question of resource extraction, not unlike the extraction of oil, gas, coal, or metals. The rules governing the rates of pumping of ground water have always been a matter of State responsibility and they should remain State responsibility.

The Federal government does have an appropriate role in research, development, and demonstration of methods of managing the extraction of ground water. This includes the development of analytical tools to better predict the consequence of various development scenarios and the interrelations of ground water and surface water supplies. The USGS has been the leader in these developments for decades and is continuing to work on improving the tools and assisting States and localities in their use.

The Bureau of Reclamation has a significant role in the development of ground water management technology. Through the High Plains States Ground Water Demonstration Program (authorized by P.L. 98-434) the Bureau is undertaking 21 artificial recharge demonstration projects in 15 of the 17 Reclamation Act States. I would furthermore suggest the potential applicability of artificial recharge technology is not confined to these relatively arid States. There are many areas of significant water-level declines in the more humid eastern and southern States. Information gained through this program may be useful to water-resource managers, State and local governments, and scientific agencies such as the USGS which have a role in studying ground-water depletion and recharge problems.

Q10 To what degree are states using land use controls to prevent ground-water contamination?

I have no special knowledge to bring to this question beyond what I have read in various reports. I would suggest that the best source of information on this question is the 1986 National Academy of Sciences report "Ground Water Quality Protection: State and Local Strategies."

Q11. Given limited fiscal resources what are the priority programs and activities to fund in these bills.

The research oriented bills (H.R. 791 and S. 1105) identify many high priority research topics. All of them are being studied at the present time. The Fiscal Year 1987 Federal expenditures on scientific and technical programs related to ground water were about $215 million. This money was dedicated to: research in hydrogeology, and the fate and transport of contaminants; resource assessments at local, regional, and national scales; applied research and development of methods of preventing, managing, cleaning up, and monitoring ground water; technical assistance; and information dissemination. Of the total expenditures, 57% were in DOI, 15% in EPA, and 9% in USDA. Research on the health effects of contaminants are not reported because it is not possible to differentiate health-effects research related to ground water from that related to surface water. Clearly, health effects of contaminants is a large and high priority research area. I would suggest that the kinds of work already going on in these programs are the highest priorities.

Q12. Please point out any exemplary state ground-water programs or add any other comments not covered in your statement.

Beyond what I have read in various reports, I have no special knowledge to bring to this question. I would suggest that the best source of information on this question is the 1986 National Academy of Sciences report "Ground Water Quality Protection: State and Local Strategies." I would note with some pride that many of the State or local programs singled out in that report as exemplary are ones that have built on the maps, data, models, and expert advice of the USGS, provided largely through the Federal-State Cooperative Program. Examples of these include: the States of Arizona, Colorado, Connecticut, Florida, and New Jersey, and regional programs of: Long Island, New York; Cape Cod, Massachusetts; and Dade County, Florida.

This concludes by statement. I would be happy to answer any questions the committee might have.

ASWIPCA
ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS
HALL OF THE STATES • 444 NORTH CAPITOL STREET, NW • SUITE 330 • WASHINGTON, DC 20001-1512 • (202) 624-7782

TESTIMONY OF THE ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

BEFORE THE SENATE

SUBCOMMITTEE ON WATER RESOURCES

AND THE

SUBCOMMITTEE ON HAZARDOUS WASTE AND TOXIC SUBSTANCES

FEBRUARY 23, 1988

Mr. Chairman, Members of the Subcommittees:

My name is Harold Reheis. I am the Assisitant Director of the Georgia Environmental Protection Division and the Vice Chair of the Association of State and Interstate Water Pollution Control Administrators' (ASIWPCA) Groundwater Task Force.

I am joined today by Roberta (Robbi) Savage, the Executive Director and the Secretary Treasurer of our organization.

ASIWPCA is the national, professional organization of State water administrators and interstate commissioners throughout this country. ASIWPCA members are responsible for the daily implementation of State water programs and work to assure their effectiveness and integrity in the States.

Among our ASIWPCA membership, we have environmental and natural resource commissioners and heads of State agencies which provides the Association with the breadth of experience and understanding to effectively relate our positions to other environmental programs including hazardous waste and solid waste management, air quality control, pesticide management. For example, I am responsible for the management of Georgia's water quality/quantity programs, along with our programs for air, solid and hazardous waste, land protection, and emergency response.

Mr. Chairman, I assure you that groundwater is a major priority with the States. As has been documented by your staff and representatives of a number of national organizations, States are on the cutting edge of the groundwater protection effort. And, in addition to the plethora of individual groundwater programs developed by the States, our national organization, ASIWPCA, has taken a lead role in providing technical exchange and program assistance to its State members. For example, ASIWPCA recently polled its members on groundwater issues, with 43 States responding. The results of that survey will be referred to throughout this testimony. ASIWPCA's position statement (attached) will also be mentioned.

As indicated, our Association has a major interest in the groundwater issue, and has done considerable work as an organization on addressing solutions to groundwater problems. For example, the Task Force of which I am Vice Chair concentrates entirely on groundwater. ASIWPCA has sponsored numerous State roundtable discussions and has in the last few years, hosted two national technical conferences for State groundwater officials.

To encourage statewide consistency, ASIWPCA has held policy and program discussions with other State organizations, such as the National Governors' Association, the Association of State Drinking Water Administrators, the Association of State and Territorial Solid Waste Management Officials, and the Western States Water Counsel.

BACKGROUND

Groundwater is the principal source of drinking water for more than 50% of the American population. With the continuing development of more effective techniques for monitoring the quality of groundwater supplies, States are increasingly concerned with maintaining and improving their groundwater quality. Under States' authorities for water, State officials are responsible for protection of the "waters of the State" (which includes groundwater) and, as a result, regulate various pollution sources which threaten groundwater quality or quantity. In fact, State groundwater management programs incorporate both preventive and remedial measures.

In addition to clean up activities, States report a number of preventive activities currently underway, including: permitting and surveillance of potential contamination sources; siting requirements for industrial and municipal waste-generating facilities; pesticide and fertilizer use; and animal waste management; public education; and prohibition of certain activities, such as land disposal of toxic sludge and hazardous waste.

Significantly, most States are now allocating and managing groundwater quantity. Because excessive pumping accelerates the development of conditions conducive to groundwater quality degradation, sound groundwater allocation is essential. It cannot be over emphasized, however, that groundwater allocation is solely a State responsibility and any Federal law designed to address water quantity would be an unacceptable encroachment on State water rights.

Many States throughout the country have rigid requirements for deep drilling for oil, gas, and minerals as well as for licensing and regulating well-drilling professionals. Training and certification programs for well drillers, to ensure proper installation procedures and well construction, have been established in most States as an additional management tool to prevent groundwater contamination.

STATE LEADERSHIP

States have very appropriately taken the lead in developing and implementing procedures to cleanup and protect this precious resource. And, it is our view that institutional arrangements for groundwater quality programs are the prerogative of the States and based on the unique legal, economic, and social conditions in each State.

Mr. Chairman, the policy statement adopted by the nation's Governors succinctly reflects the State perspective:

- The Governors endorse and recommend "a new national policy to systematically accelerate and strengthen protection of our underground water supplies"...
- "This policy must articulate the States' primary authority and responsibility for groundwater management"...
- "States are best equipped to respond to the local nature of groundwater and must have substantial flexibility to design programs responsive to the resources within their boundaries."

STATE ROLE

The ASIWPCA position is even more specific:

1. The States must continue to be fully responsible for management of groundwater quality and quantity. Institutional arrangements should be the prerogative of each State based on the unique legal, economic, and social conditions, as well as regional, geologic and climatic conditions, which control groundwater quality and quantity.
2. States should determine the degree and extent of groundwater pollution and consider the effects of degradation of other States' waters.
3. States should develop and maintain comprehensive groundwater quality programs.
4. States should provide adequate financial support to achieve and maintain groundwater quality programs.

Federal legislation must preserve the lead role for State management of groundwater quality and quantity. States should be responsible for groundwater quality standards, classification systems (with State discretion for uniform classifications), resource assessment, protection strategies development and monitoring programs.

State programs should be developed to assure compliance with relevant groundwater standards. Pollution sources of national concern include: solid waste disposal, hazardous waste disposal on land surface and subsurface, pesticide use, and underground injection activities. States should certify that their program elements meet the requirements of the Federal law. In addition, State programs should recognize and encourage local roles in groundwater protection (e.g. land use). Periodic State reports on groundwater quality should be made to USEPA.

ASIWPCA's groundwater questionnaire indicates that 98% of States use permits to control discharges to groundwater. Furthermore, 77% of the States have comprehensive groundwater quality regulatory systems or protective strategies in place, and the remaining 23% will have such systems or strategies in place before the end of 1988.

States are actively monitoring groundwater under the Safe Drinking Water Act requirements for public water supply systems. In addition, 70% of the States are conducting other types of groundwater monitoring, with 50% operating statewide ambient groundwater monitoring networks. It is important to recognize that States already have a broad base of State legislation, regulation and monitoring data with which to manage groundwater quality. In 13 categories of groundwater quality problems we identified which are not currently covered by the major Federal groundwater laws, at least 70% and as high as 98% of the States indicate that existing State laws and/or regulations are adequate to address these problems.

FEDERAL ROLE

ASIWPCA'S groundwater position also outlines the appropriate Federal role:

1. The Federal government should provide technical assistance, support research and development, and disseminate information to States.

2. The Federal government should assist States in the review and definition of geologic and climatic conditions controlling groundwater quality and quantity. The Federal government should have no responsibility in groundwater quantity management.

3. The Federal government should involve States in Federal activities and provide adequate financial support for State program elements addressing interstate groundwater quality.

4. The Federal government should provide States with mechanisms to translate research results into usable recommendations and guideline values.

FEDERAL LEGISLATION

Existing Federal laws and regulations have not addressed groundwater in a coordinated manner and have created numerous administrative and statutory inconsistencies.

To give you an idea of the plethora of complex statutory authorities currently governing the protection of our groundwater, we have listed the principal statutes below:

- Clean Water Act,
- Safe Drinking Water Act,
- Resource Conservation and Recovery Act,
- Comprehensive Environmental Response, Compensation, and Liability Act,
- Federal Insecticide, Fungicide, and Rodenticide Act,
- Surface Mining Control and Reclamation Act,
- Toxic Substances Control Act,
- Atomic Energy Act,
- Coastal Zone Management Act,
- Federal Land Policy and Management Act,
- Hazardous Liquid Pipeline Safely Act,
- Hazardous Materials Transportation Act, and
- Uranium Mill Tailings Radiation Control Act.

Because of this morass of Federal requirements, it is not surprising that of the States polled:

- 68% believe that inconsistencies or duplications in Federal laws have created problems in groundwater protection.

- 95% agree that Federal environmental laws related to groundwater should be changed to achieve better coordination and consistency.

By way of a hypothetical example of administrative and statutory inconsistencies, imagine three independent industries, all producing waste with heavy metals and all located within a half a mile of each other. Industry A discharges its wastewater into a holding lagoon that is actively used and covered under RCRA. Industry B at one time put its waste into a holding lagoon and the inactive lagoon is now covered under Superfund. Industry C discharges its waste into a lagoon which has an National Pollutant Elimination and Discharge System (NPDES) permit to discharge its effluent into a local stream, as authorized under the Clean Water Act.

Assuming that all three lagoons are leaching heavy metals into the same aquifer at essentially the same rate, you would naturally assume consistent corrective actions should be taken for all three. Regrettably, this is not the case because, under current Federal laws and regulations, Industry A is required to cleanup its groundwater contamination to the point that it equals the natural or background quality of local groundwater. Industry B is required to do a cleanup that is determined to be "cost effective". Industry C may not be required to address groundwater.

The bottom line is this. All of these industries are creating essentially the same type and magnitude of contamination. However, the requirements for action under existing Federal statutes are vastly different. This type of inconsistency significantly retards the States' efforts to implement a sensible, comprehensive and effective groundwater management program.

ASIWPCA RECOMMENDATIONS

ASIWPCA members recognize the potential for enactment of some type of groundwater legislation. However, States are convinced that any such legislation should address the comprehensive nature of groundwater and the plethora of existing Federal legislative mandates currently imposed on State and local governments. This does not mean however, that Federal legislation should simply duplicate existing requirements. ASIWPCA recommends that any new Federal groundwater legislation incorporate the following:

- The National focus, both in terms of research and regulation, should be on manmade contaminants which adversely affect human use of groundwater and human health. Areas of research, for example, which do not relate directly to prevention or remedial action for human-induced contaminants are of lower priority.
- The National goal must be to protect human health and the environment by preventing and mitigating groundwater pollution wherever possible. Groundwater must be protected for the highest identified and potential use, as determined by the States.

In addition, ASIWPCA recommends that any legislation encompass five main principles:

1. USEPA must quickly develop health-based criteria for a reasonably large number of common or pervasive groundwater contaminants.
2. States must classify their groundwater and adopt ambient groundwater quality standards using USEPA's criteria as guidelines.
3. Upon adoption, each States' standards should become the basis of cleanup or control under any Federal program relating to groundwater in the State.
4. States must define and implement programs to assure attainment and maintenance of groundwater standards and to minimize groundwater quality degradation.
5. State groundwater programs must address contamination sources of national concern to the extent that such sources are significant in that State.

FUNDING

The States are already carrying out significant activities to assess, monitor, protect and manage groundwater quality through existing State and Federal laws. New Federal funding authorization for the States is not required to implement the recommended Federal legislation if the five principles listed above are adopted.

The inconsistencies, which have been created by uncoordinated Federal laws impacting groundwater, are obstacles to effective groundwater quality management. If these obstacles are removed by the Federal legislation described in the ASIWPCA position, the States can conduct effective groundwater quality programs without substantial, additional Federal funding.

However, if prescriptive Federal legislation is enacted by the Congress, States will need additional Federal funding to carry out these program responsibilities.

STANDARDS

State groundwater programs need dependable criteria for assessing contaminants which affect drinking water uses--both in terms of health and aesthetic effects. USEPA should be required to give highest priority to providing those criteria and risk assessments in an expeditious manner. State groundwater standards developed under a new Federal law should apply equally to all Federal programs including those administered under the Clean Water Act, (CWA) Resource Conservation and Recovery Act, (RCRA), Federal Insecticide, Fungicide and Rodenticide Act, (FIFRA) Superfund Act and Safe Drinking Water Act (SDWA).

Nearly three-fourth's of the States responding to our survey indicate that a new Federal groundwater law is needed to eliminate inconsistencies by using State-established groundwater cleanup or control standards for all Federal programs relating to groundwater. More than three-fourths of the States believe that the most effective management method for cleaning up existing groundwater quality problems and for preventing new ones would be to use ambient groundwater quality standards either alone or in combination with a classification system.

Interestingly, 45% of the States currently use groundwater classification systems and nearly 61% of the States, responding to the ASIWPCA survey, currently use numerical groundwater quality standards. In addition, 77% of the respondents believe that ambient standards, groundwater classification, or a combination thereof could be effective to prevent significant new groundwater contamination. However, States caution that these are only 2 of the many tools at their disposal (e.g. land management through siting, zoning, etc.).

TYPES OF PROBLEMS

The States support the concept of addressing groundwater contamination sources of national concern to the extent that such are significant in any given State. Our questionnaire indicated that more than 50% of the States have experienced major or moderate groundwater quality problems with:

.. improper storage and use of chemicals,
.. disposal of solid waste,
.. septic tanks, and
.. contaminants from spills.

Furthermore, more than 40% of the responding States have experienced major or moderate groundwater quality problems from use of pesticides, fertilizers, and industrial waste lagoons.

However, more that 70% of the States consider their existing State laws adequate to deal with these problems. And, the framework of ambient water quality standards and groundwater classifications over time will enhance the State programs that currently exist.

In addition, sixty-eight percent of the States responding to the ASIWPCA survey indicate that the FIFRA reauthorization should incorporate some groundwater protection activities that would be the responsibility of the States. Again, with the passage of S. 20, all Federal statutory programs would be held to the same groundwater standard.

RESEARCH

As previously mentioned, the Federal government should provide technical assistance, support research and development and disseminate information to the States. The Federal government should also have a major role in translating research into useful guidelines (technology transfer). There is a great need for increased research related to human-induced toxic contaminants.

Research, technical assistance and information dissemination on best management practices to prevent agricultural contamination is an area where the US Department of Agriculture could be of greater assistance. The States are dependent upon Federal research in order to successfully implement a myriad of environmental programs. Our ASIWPCA survey indicates that States view research as a primary role of the Federal government. Specifically, ASIWPCA members identified a variety of research needs, and provided the State perspective on which Federal agency should take the lead:

Research Subject	Lead Agency
(A) Aquifer Mapping:	USGS (58%); States (38%); USEPA (2%); Other (2%).
(B) Development of New Computer Models:	USGS (44%); USEPA (31%); States (11%); NSF (10%); Other (4%).
(C) Development of Groundwater Quality Standards:	USEPA (50%); States (50%).
(D) Sampling Protocols:	USEPA (56%); USGS (20%); States (19%); NSF (5%).
(E) Behavior of Pollutants in Groundwater:	USEPA (54%); NSF (24%); USGS (17%); States (5%).

(F) Development of Groundwater Clean-Up Technologies: USEPA (63%); NSF (18%); States (11%); Industry (7%); USGS (1%).

(G) General Groundwater Flow: USGS (63%); States (29%); NSF (4%); USEPA (4%).

(H) Risk Assessment: USEPA (57%); NSF (22%); States (19%); Other (2%).

(I) Pesticide Application Practices: USEPA (51%); States (25%); USDA (15%); NSF (7%); USGS (2%)

(J) Technology Transfer: USEPA (57%); USGS (29%); NSF (10%); Other (4%).

SUMMARY

Mr. Chairman, ASIWPCA is supportive of S. 20 because it provides the basic framework for a rational, workable and effective national groundwater program. To enhance its foundation, ASIWPCA has some suggestions which we have included in the attached marked-up version of S.20.

On behalf of the Association, we extend to you our appreciation for inviting us to appear before this Subcommittee. And, in closing, Mr. Chairman, we would ask that a copy of a recent ASIWPCA report, America's Clean Water - The States' Nonpoint Source Assessment, and the proceedings of the recent State Groundwater Technical Exchange Seminar be included as a part of the record.

Again, we appreciate your kind invitation to present the ASIWPCA testimony.

ASIWPCA

ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS
HALL OF THE STATES • 444 NORTH CAPITOL STREET, NW • SUITE 330 • WASHINGTON, DC 20001-1512 • (202) 624-7782

RELATED ASIWPCA POSITIONS

REFERENCE: (Related Position) - GROUNDWATER

ASIWPCA POSITION

A. Groundwater Quality Program Purpose and Organization

1. The goal of national groundwater policy must be to protect human health and the environment by preventing and mitigating groundwater pollution wherever possible.

2. National groundwater policies must be established to avoid adverse impacts and protect existing and potential groundwater uses.

3. Existing State and Federal statutes, regulations and program responsibilities must be reviewed and amended as necessary to improve existing groundwater quality programs.

4. Regional groundwater quality criteria are needed that transcend State borders and are based on natural groundwater systems including regional geology and climatic conditions.

B. State Role

1. State governments must continue to be fully responsible for management of groundwater quality and quantity. They must also continue to resolve groundwater quality and quantity policy in conjunction with local governments. Institutional arrangements should be the prerogative of the State based on unique legal, economic, and social conditions as well as regional geologic and climatic conditions controlling groundwater quality, availability and volume.

2. States should determine the degree and extent of groundwater pollution wherever possible. Their programs must consider the effect of degradation on other States' waters.

3. States should develop and maintain comprehensive groundwater quality programs, including an inventory of uses and groundwater quality criteria on a hydrogeologic basis.

4. State governments should provide adequate financial support to achieve and maintain groundwater quality programs.

C. Federal Role

1. The Federal government should provide technical assistance, support research and development, and coordinate and disseminate information to States. This should include developing and maintaining an integrated nationwide data base and computer facilities.

2. The Federal government should assist States in the review and definition of geologic and climatic conditions controlling groundwater quality and quantity. The Federal Government should maintain and expand the long-term groundwater related activities of the U.S. Geological Survey.

3. The Federal government should involve States in their activities and provide adequate financial support for State program elements addressing interstate groundwater quality. Appropriate State and Federally authorized Interstate Agencies should receive Federal funds for groundwater and aquifer protection. In carrying out management activities, these Agencies should involve local and regional entities.

4. To encourage national scientific and policy consistency, the Federal Government should provide mechanisms to translate research results into usable recommendations and guideline values for use at the States' option in their groundwater management programs.

5. The Federal government must continue to have no responsibility or authority in the management of groundwater quantity.

D. Groundwater Legislation

1. Existing Federal laws and regulations are primarily directed toward specific pollution sources such as sewage, solid waste, hazardous waste, and underground injection. These laws have not addressed groundwater in a coordinated manner and have created administrative and statutory inconsistencies. Federal legislation, which embodies the following principles, is needed to resolve these inconsistencies:

   (a) US EPA must quickly develop health-based criteria for a significant number of groundwater contaminants. Adequate funding must be appropriated so US EPA can accomplish this in a timely fashion.

   (b) The States must classify their groundwaters and adopt ambient groundwater quality standards using US EPA's criteria as guides.

(c) Upon adoption, each State's standards become the basis of clean-up or control under any Federal Program relating to protection of groundwater in the State.

(d) The States must, on a reasonable schedule, define and implement programs and activities to assure the maintenance and attainment of ambient groundwater quality standards, and minimize degradation.

(e) State groundwater programs must address groundwater contamination sources of national concern, to the extent that such sources are significant in a given State. Such programs need not be regulatory.

ADOPTED: August 1983
REVISED: August 1987

RATIONALE

Programs must be developed and enhanced to prevent and mitigate groundwater pollution. Existing Federal statutes including the CWA, SDWA, RCRA, FIFRA, and CERCLA establish differing procedures to control groundwater quality. Federal programs must be based on a more consistent set of objectives carried out through complementary processes which may be applied by States. Resolution of groundwater quality/quantity conflicts is a State responsibility. As the program progresses, an ongoing review process (including economic considerations) must be used to make revisions.

Groundwater problems do not recognize boundaries and research can be most effectively accomplished at the Federal level. The information generated should be beneficial to States but must not be mandatory given unique hydrogeologic conditions of each State and the judgments required in risk assessment and regulatory decision making.

While non-degradation of groundwater is an admirable goal, it is not a practical one. Non-degradation cannot be accomplished unless all future septic tanks, all land application systems for wastewater, and many pesticide uses are prohibited. The concept of minimizing groundwater degradation (anti-degradation) is achievable and is supported by the States.

The States are already carrying out significant activities to assess, monitor, protect, and manage groundwater quality through existing State and Federal laws. New Federal funding authorization for the States is not required to implement the recommended Federal legislation if the principles listed in Paragraph D above are strictly followed. If prescriptive Federal legislation is enacted, the States will need additional Federal funding to carry out these programs.

The inconsistencies, which have been created by uncoordinated Federal groundwater laws, are obstacles to effective groundwater quality management. If these obstacles are removed by the Federal legislation described in Paragraph D, the States can conduct effective groundwater quality programs without additional Federal funding.

RATIONALE FOR ASIWPCA's SUGGESTED CHANGES TO S.B.20

P.1, Line 9	The States must retain the responsibilities they currently have with regard to designation of uses for their waters.
P.2, Lines 5-13	Natural contamination of ground water is not an issue for national legislation. The focus must be on man-made contaminants and contamination which adversely affect human health first, and other uses of ground water second.
P.2, Line 21	The States' greatest need is criteria for the contaminants which affect public health. EPA should have no higher priorities.
P.3, Lines 7-11	Same as for P.2., Line 21.
P.3, Lines 12-13	If a State needs criteria for contaminants impacting uses other than drinking water, that State may develop such. Again, EPA's priorities must not be diverted from developing criteria to protect human health.
P.3, Lines 14-21	Language is overly prescriptive and assumes EPA must be ordered to do something which makes sense, when simply asking EPA to do so would suffice.
P.5, Line 5	Six months is an excessive length of time for an action as simple as appointing a panel. The criteria are so urgently needed that all unnecessary delays must be eliminated.
P.5, Lines 17 & 19	Having a State panel with membership from each EPA Region will assure better and fairer representation for the States.
P.6, Lines 9, 11-13	Again, the national priority must focus on public health (drinking water). A State may address other uses with standards if other uses are important to that State.
P.6, Lines 13-14	Non-degradation standards are impractical and unattainable except in areas that are not presently farmed or developed and will never be farmed or developed. Adequate protection will be afforded through anti-degradation standards.
P.6, Lines 21-22	Same as for P.2, Line 21.
P.7, Lines 9-10	Areas with specific background quality are also legitimate areas to be designated as special ground water systems.
P.7, Line 14	Numerical standards may not be appropriate or necessary for some special ground water systems. The flexibility not to use numerical criteria should be maintained.
P.7, Lines 17-18	Same as for P.7, Lines 9-10.
P.7, Lines 21, 23-24	Examples are not needed and may tend to limit unnecessarily the use of special ground water system designations.

P.8, Lines 12, 14, 15, 17, 18	"Compliance" implies an intensive regulatory program. "Attainment" is a more positive term and is more in keeping with the fact that some ground water protection will be achieved through non-regulatory programs such as education, use of best management practices, etc.
P.9, Lines 9, 11, 17	Six months is an excessive amount of time for public comment or comment by the Administrator.
P.9, Line 14	A review every three years is a carryover from the Clean Water Act. Situations do not change so rapidly as to justify a triennial review either for surface water or ground water quality standards. Five years is certainly frequent enough; States can always review more frequently if they choose.
P.9, Line 22 through P.10, Line 25	It seems appropriate to name all Federal statutes which have programs relating to protection of ground water so there will be no questions as to intent.
P.11, Lines 1-3	The addition is to clarify intent further and is in keeping with the language on P.9, Lines 19-21.
P.11, Lines 22,25, and P.12, Lines 1-3, 5-8	Virtually every State has been conducting assessments of its ground water resources for years. In most cases, States can readily meld existing studies into assessments which will meet the requirements of Sec.6.(a). Long and complex timetables are unneeded. Guidance from EPA should be minimal, since the requirements of Sec.6.(a) are prescriptive enough, and since under ASIWPCA's proposed changes to this bill, there will be no Federal funding provided to the States.
P.11, Lines 23-24	There is no need to have the States dealing with, or answerable to, two Federal agencies on ground water programs. Such a situation does not exist in the other major Federal environmental laws. EPA may exercise its prerogative to consult with the USGS very closely on many aspects of the programs called for in this Act. EPA may send State assessments and other reports to USGS if it chooses to do so, but States should deal only with EPA.
P.12, Line 11	Same as P.11, Lines 23-24.
P.12, Lines 12, 14-16	"Management" implies control over water allocations; "protection" implies control over water quality. This Act must deal only with water quality.
P.12, Line 19	Local programs are an important and necessary element of a comprehensive ground water protection strategy in most States.
P.13, Lines 3-7	Defining how to go about attaining ground water standards is the most important element of a strategy.

P.13, Line 8	Same as P.12, Lines 12, 14-16.
P.14, Lines 16-17 and 21-22	Same as P.11, Lines 23-24.
P.15, Lines 8-9	Same as P.11, Lines 23-24.
P.15, Line 13-14	Same as P.8, Lines 12, 14, 15, 17, 18.
P.16, Line 7	Same as P.12, Lines 12, 14-16.
P.17, Lines 4-9	Same P.9, Line 22 through P.10, Line 25.
P.17, Lines 14-16	Some facilities or activities are designed to discharge, such as septic tank tile fields and wastewater spray irrigation systems. However, it is entirely appropriate to prohibit discharges from some other types of facilities or activities.
P.17, Lines 17-21	Guidance is not needed, and may only delay the preparation and submittal of protection programs by the States. The language of Sec.9 is sufficiently prescriptive to serve as guidance.
P.18, Lines 8, 10	Six months is an excessive amount of time for comment by the public and the Administrator.
P.19, Line 1 through P.21, Line 15	Virtually every State has been conducting ground water planning assessments, monitoring, and protection activities for years. These activities are currently funded. Existing Federal and State statutes provide for a considerable amount of ground water protection. Since most States can comply with this Act without starting up major new activities which require significant funding, and since the States are cognizant and supportive of the need to balance the Federal budget, ASIWPCA recommends no Federal funding to the States for implementation of this Act.
P.21, Lines 16-25	Since EPA has existing funded staff dealing with ground water protection programs, and since the responsibilities of EPA under this Act are minimal aside from development of criteria under Sec.4, EPA should be funded only for the work it needs to conduct under Sec.4. Since this work is to be completed within 30 months of the date of enactment, funding is needed only in the first three fiscal years after enactment.
P.22, Lines 1-5	This language is needed to assure that the Act does not imply or create any involvement with regulation of water use or allocation of water rights.

S.20

A BILL

To provide for the protection of ground water through State standards, planning, and protection programs.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Ground Water Protection Act of 1987".

DECLARATION OF POLICY

SEC.2. It is the policy of the United States to protect the quality of ground water resources for drinking and other uses as determined by the States.

DEFINITIONS

SEC.3. For purposes of this Act -

(1) the term "Administrator" means the Administrator of the Environmental Protection Agency;

~~(2) the term "contaminant" means any manmade or natural physical, chemical, biological, or radiological substance or matter in ground water; and~~

(2) the term "contaminant" means any substance which causes contamination; and

(3) the term "contamination" means an impairment of the quality of ground water to a degree which creates a hazard to the public health or which otherwise renders the ground water unusable; and

~~(3)~~(4) the term "State" means the 50 States, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, the Northern Mariana Islands, American Samoa, and the Trust Territory of the Pacific Islands.

GROUND WATER QUALITY CRITERIA

SEC. 4. (a) ESTABLISHMENT OF CRITERIA. - (1) The Administrator shall establish criteria for ground water quality with respect to those contaminants affecting public health and found in ground water. Such criteria shall reflect the latest scientific knowledge on -

(A) the physical, chemical, biological, and radiological properties of the contaminant;

(B) the association of the contaminant with various sources of ground water contamination; and

(C) existing and needed research relating to the contaminant.

(2) The criteria established under this subsection shall include an analysis of the risk posed by the contaminant to human health ~~and the environment at various concentrations~~ in ground water. ~~and with respect to various uses of the water. Such analysis for each contaminant shall include a comparison of the risks posed by such contaminant to risks posed by other ground water contaminants.~~

(3) The States may develop criteria for contaminants which impact other uses.

~~(b) FORMAT. The Administrator shall establish and utilize a standard format for presentation of ground water criteria. The format shall be designed to facilitate State development of ground water quality standards under section 5. The format shall include a summary of the research and analysis of the contaminant which shall be understandable to public health professionals who lack training in toxicology.~~

~~(c)~~ (b) USE OF AVAILABLE DATA AND ADDITIONAL STUDIES. -

(1) In establishing criteria under this section, the Administrator shall use, to the fullest extent practicable, any data or analysis developed, or planned to be

developed, by the Agency for Toxic Substances and Disease Registry.

(2) In establishing the criteria under this section the Administrator shall consider criteria, data, and analyses developed pursuant to the Federal Water Pollution Control Act, title XIV of the Public Health Service Act (commonly referred to as the Safe Drinking Water Act), and the Toxic Substances Control Act.

(3) The Administrator shall conduct studies to the extent necessary to establish criteria under this section. Such studies may be conducted in conjunction with the Agency for Toxic Substances and Disease Registry. The Administrator may use the authorities of sections 4 and 8 of the Toxic Substances Control Act to gather data necessary to establish criteria under this section.

~~(d)~~ (c) TIMETABLE FOR ESTABLISHING CRITERIA. - (1) The Administrator shall establish criteria under this section for not less than 50 high priority contaminants within 18 months after the date of the enactment of this Act.

(2) The Administrator shall establish criteria under this section for not less than 50 additional high priority contaminants within 30 months after the date of the enactment of this Act.

(3) The Administrator shall establish criteria under this section for additional contaminants on an ongoing

basis and at a rate which is consistent with the needs of the States in developing ground water quality standards under section 5.

~~(c)~~ (d) ADVISORY PANEL. - (1) The Administrator shall, within ~~6~~ 3 months after the date of the enactment of this Act, appoint a panel to advise him with respect to the implementation of this section, including (but not limited to) the contaminants for which criteria should be established, the rate at which the criteria should be established, and the quality and format of the criteria documents.

(2) The panel shall be chaired jointly by a senior official of the Environmental Protection Agency, to be selected by the Administrator, and a senior official of the Agency for Toxic Substances and Disease Registry, to be selected by the Secretary of Health and Human Services.

(3) The panel shall include not less than ~~6~~ 10 representatives of State agencies involved with ground water protection, with not less than one from each EPA Region, and representatives of other Federal agencies involved with ground water protection, as selected by the Administrator, with the concurrence of the Secretary of Health and Human Services.

~~(f)~~ (e) RESEARCH ACTIVITIES. - The Administrator shall provide for such additional research activities as he deems necessary to support the effective development and implementation of ground water standards and protection programs. The Administrator shall provide for effective coordination of ground water-related research within the Environmental Protection Agency and among other Federal agencies.

STATE GROUND WATER PROTECTION STANDARDS

SEC.5.(a) AMBIENT GROUND WATER STANDARDS . - (1) Each State shall, for drinking water uses, establish numerical standards for contaminants found in the ambient ground water. Each State may, for other water uses, establish numerical standards for contaminants found in the ambient ground water. States may establish ~~nondegradation~~ antidegradation standards for any contaminant or contaminants in the ambient ground water.

(2) Ambient ground water quality standards shall apply uniformly to all geographic areas in the State and all geological structures, unless the area or structure is designated by the State as a special ground water system under subsection (b).

(3) Ambient ground water quality standards for drinking water uses shall, except as otherwise provided in subsection (b) for special ground water systems, be at least as stringent as the primary drinking water standard established under title XIV of the Public Health Service Act

(commonly referred to as the Safe Drinking Water Act) for the particular contaminant (if such a standard has been established under such Act).

(b) STANDARDS FOR SPECIAL GROUND WATER SYSTEMS. - (1) The State may identify discrete and defined ground water systems within the State and establish special ground water quality standards for such systems.

(2) Special ground water systems may be defined, to the extent possible, by a specific background water quality, geographic area or geologic structure. The definition of such system shall be a part of the standard.

(3) Standards for special ground water systems may vary according to the specific use of the special ground water system. Such standards ~~shall be numerical and~~ shall be based on an assessment of the risks to human health and the environment inherent in such uses.

(4) Special ground water systems may include areas of background water quality, geographic areas or geologic structures associated with uses which may require more stringent standards than those established under subsection (a) ~~(such as recharge of a valuable ecosystem)~~ and uses which may require less stringent standards than those established under subsection (a) ~~(such as agriculture, waste disposal, industrial processes, and mining)~~.

(c) ESTABLISHMENT OF STANDARDS. - (1) In establishing standards under subsections (a) and (b), the State shall utilize the criteria established by the Administrator under section 4, and any other data which the State determines to be appropriate.

(2) The State shall establish standards under subsections (a) and (b) for the high priority contaminants for which the Administrator has established criteria under paragraphs (1) and (2) of section 4(d), unless the State determines that such contaminant is not found in such State, and may establish standards for any other contaminants found in the State.

(d) ~~-COMPLIANCE-~~ ATTAINMENT. - (1) In establishing standards under subsections (a) and (b), the State shall establish specific procedures and methods for determining ~~compliance-with~~ evaluating attainment of such standards.

(2) The Administrator shall publish guidance and information describing procedures and methods for ~~determining compliance--with~~ evaluating attainment of such standards within 12 months after the date of the enactment of this Act.

(e) TIMETABLE FOR ESTABLISHING STANDARDS. - (1) The State shall propose standards for ambient ground water and for any special systems for those contaminants for which criteria have been established under section 4(d)(1) within 30 months after the date of the enactment of this

Act.

(2) The State shall propose standards for ambient ground water and for any special systems for those contaminants for which criteria have been established under section 4(d)(2) within 42 months after the date of the enactment of this Act.

(3) Any ground water standards proposed by the State shall be made available for comment to the Administrator and the public for a period of ~~6-months~~ 30 days. The State shall establish final standards within 12 months after the close of such ~~6-month~~ 30 day comment period.

(4) The State shall review, revise, if necessary, and expand, if appropriate, the standards established under this section not less often than every ~~3~~ 5 years. Any proposed revisions or additions to State standards shall be made available for comment to the Administrator and the public for a period of ~~6-months~~ 30 days.

(f) STATE. STANDARDS TO APPLY UNDER FEDERAL PROGRAMS. - Any standard established by the State under this section shall apply as the standard of cleanup or control under any Federal program relating to protection of ground water. ~~including--(but--not--limited--to)--the--Solid--Waste--Disposal Act--and--the--Comprehensive--Environmental--Response,--Compensation,--and--Liability--Act--of--1980~~. These Federal programs include, but are not limited to all those conducted under the following Federal statutes:

(1) Clean Water Act, 33 U.S.C. §§1251 et seq.;

(2) Safe Drinking Water Act, 42 U.S.C. §§300(f) et seq.;

(3) Resource Conservation and Recovery Act, 42 U.S.C. §§5901 et seq.;

(4) Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§9601 et seq.;

(5) Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§136 et seq.;

(6) Surface Mining Control and Reclamation Act, 30 U.S.C. §§1201 et seq.;

(7) Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.;

(8) Atomic Energy Act, 42 U.S.C. §§2011 et seq.;

(9) Coastal Zone Management Act, 16 U.S.C. §§1451 et seq.;

(10) Federal Land Policy and Management Act, 43 U.S.C. §§1701 et seq.;

(11) Hazardous Liquid Pipeline Safety Act, 49 U.S.C. §§2001 et seq.;

(12) Hazardous Materials Transportation Act, 49 U.S.C. §§1471 et seq.; and

(13) Uranium Mill Tailings Radiation Control Act 42 U.S.C. §§2014 et seq.

(g) In the event of a conflict between the implementation of the programs of the aforementioned statutes and this Act, this Act shall prevail.

GROUND WATER RESOURCE ASSESSMENT

SEC.6. (a) REQUIREMENTS. - The State shall develop an assessment of ground water resources within such State. Such assessment shall -

(1) be sufficient to characterize ground water resources for management and protection purposes;

(2) provide a baseline for future monitoring of ground water;

(3) provide a basis for identification of special use ground water systems for purposes of section 5(b), and determination of contaminants present in such systems;

(4) focus on ground water quality, but may address ground water quantity if quantity will have a substantial impact on the design of programs to protect ground water quality; and

(5) be developed in consultation with the United States Geological Survey.

(b) ~~TIMETABLE FOR ASSESSMENT~~ GUIDANCE. - (1) The Administrator ~~and the Director of the United States Geological Survey~~ shall, after consultation with the States, ~~jointly~~ issue guidance to the States describing ~~the appropriate~~ options for content and format for assessments under subsection (a) ~~within 18 months after the date of the enactment of this Act,~~

(2) The State shall complete the assessment under subsection (a) ~~within 30 months after the date of the enactment of this Act,~~ .

~~(3) Upon completion of the assessment under subsection (a),~~ the State shall certify to the Administrator that such assessment meets the requirements of this section, and shall provide copies of the assessment to the Administrator ~~and the Director of the United States Geological Survey~~.

GROUND WATER ~~MANAGEMENT~~ PROTECTION STRATEGY

SEC.7.(a) REQUIREMENTS. - The State shall develop a ~~management~~ protection strategy with respect to ground water resources within such State. Such ~~management~~ protection strategy shall -

(1) identify a lead agency and provide an institutional framework for protection of ground water quality including appropriate local government programs,

(2) identify major sources of ground water contamination and the contaminants associated with each such source;

(3) assure coordination among Federal, State, and local agencies involved in ground water protection; and

(4) assure coordination of groundwater protection programs with surface water protection programs and with the activities of public water supply systems~~.~~; and

(5) define programs, activities, and methods to assure the attainment of ambient ground water standards.

(b) TIMETABLE FOR ~~MANAGEMENT~~ PROTECTION STRATEGY. - (1) The State shall complete the development of an initial ground water management strategy under subsection (a) within 24 months after the date of the enactment of this Act.

(2) Upon completion of such strategy development, the State shall certify to the Administrator that such strategy meets the requirements of this section, and shall provide a description of the strategy to the Administrator.

(3) The State shall annually review and, if necessary, revise the management strategy to reflect any relevant change in conditions, and shall provide a description of any revised strategy to the Administrator.

GROUNDWATER MONITORING

SEC.8.(a) REQUIREMENTS. - The State shall establish a program of monitoring with respect to ground water resources within such State. Such monitoring program shall -

(1) be capable of assessing compliance with the standards established by the State under section 5, including standards for special systems established under section 5(b);

(2) be designed to provide periodic assessments of ground water quality trends and to identify emerging or future ground water contaminants and contamination sources;

(3) establish the institutional and agency responsibilities for monitoring; and

(4) establish the methods and procedures for monitoring.

(b) TIMETABLE FOR MONITORING PROGRAM. - (1) The Administrator ~~and the Director of the United States Geological Survey~~ shall ~~jointly~~ prepare a report to Congress evaluating alternative designs for a national ground water quality data management system within 18 months after the date of the enactment of this Act.

(2) The Administrator ~~and the Director of the United States Geological Survey~~ shall ~~jointly~~, ~~and~~ in consultation with the States, prepare a guidance document for use by States in developing ground water monitoring programs under subsection (a) within 24 months after the date of the enact-

ment of this Act.

(3) The State shall establish a ground water monitoring program under subsection (a) within 36 months after the date of the enactment of this Act.

(4) Upon the establishment of such program, the State shall certify to the Administrator that such program meets the requirements of this section, and shall provide a description of such program to the Administrator ~~and--to the-Director-of-the-United-States-Geological-Survey~~.

(c) REPORTS ON GROUND WATER QUALITY. - (1) The State shall submit to the Administrator a report which provides a summary of ground water quality and trends in the State, and which describes the status of ~~compliance-with~~ attainment of the standards established under section 5, including the standards for special systems established under section 5(b), within 30 months after the date of the enactment of this Act, and biennially thereafter. The State may use the ground water resource assessment submitted under section 6 in lieu of the first report otherwise required under this subsection.

(2) The Administrator may establish reasonable requirements regarding the content and format of reports required under paragraph (1) in order to assure compatibility of data at the national level.

GROUND WATER PROTECTION PROGRAM

SEC.9.(a) REQUIREMENTS. - (1) The State shall establish a ground water protection program which is capable of assuring compliance with the State ground water standards established under section 5.

(2) The State ground water protection program shall include individual elements addressing each source of ground water contamination identified in the ~~management~~ protection strategy pursuant to section 7(a)(2).

(3) The State ground water protection program shall include program elements addressing the following sources of ground water contamination that are of national concern:

(A) solid waste disposal;

(B) hazardous waste disposal;

(C) underground storage tanks and pipes;

(D) subsurface sewage disposal;

(E) pesticide use; and

(F) underground injection.

States shall, to the extent practicable, review and assess the interactive effects of such sources.

(4) The State may waive the requirement to develop ground water protection program elements identified in paragraph (3) by an affirmative demonstration to the Administrator that the source of contamination is not significant in that State and that ground water quality standards may be attained without establishment of a program for the

identified source of contamination.

(5) The State ground water protection program may include programs established under other Federal laws, including ~~the Solid Waste Disposal Act, title XIV of the Public Health Service Act (commonly referred to as the Safe Drinking Water Act), the Federal Insecticide, Fungicide, and Rodenticide Act, and the Federal Water Pollution Control Act.~~ , but not limited to, the statutes named in Section 5(f) of this Act.

(6) The ground water protection program elements may utilize regulations, voluntary controls, education, and any other measures which the State deems necessary and appropriate to assure compliance with ground water standards pursuant to section 5, including prohibition of any ground water discharge from specified classes of facilities and activities.

~~(7) The Administrator shall, after consultation with the States, provide States with guidance concerning the design, structure, and format of State ground water programs within 18 months after the date of the enactment of this Act.~~

(b) TIMETABLE FOR ESTABLISHING PROTECTION PROGRAM. - (1) The State shall propose a ground water protection program addressing sources of contamination identified in Section 7(a)(2) within 36 months after the date of the enactment of this Act.

(2) The State shall propose a ground water protection program addressing sources of contamination identified in section 9(a)(3) within 48 months after the date of the enactment of this Act.

(3) Proposed ground water protection plans shall be made available for comment to the Administrator and the public for a period of 6-months 30 days. The State shall establish a final ground water protection program within 6 months after the close of the 6-month 30 day comment period.

(4) The State shall annually review and, if necessary, revise the final ground water protection program to reflect any relevant change in conditions, and shall provide a description of any such revision to the Administrator.

(c) EPA ASSESSMENT OF STATE PROGRAM. - The Administrator may conduct an assessment of a State program (or any program element thereof) developed under this section if the Administrator has reason to believe that the State program (or element) does not comply with the requirements of this section. Such assessment may include public hearings. The Administrator shall report the results of any such assessment, together with recommendations for needed actions, to the State within 6 months after initiating such assessment.

~~GRANTS TO STATES~~

~~SEC. 10. (a) GRANTS FOR GROUND WATER RESOURCE ASSESSMENTS.— (1) The Director of the United States Geological Survey shall make grants to States for the purpose of assisting the States in carrying out ground water resource assessments under section 6.~~

~~(2) There are authorized to be appropriated for grants under this subsection $25,000,000 for each of the first 3 fiscal years beginning after the date of the enactment of this Act.~~

~~(3) The amount appropriated for each such fiscal year for grants under this subsection shall be apportioned among the States by the Director on the basis of the geographic area of the State, the percentage of the population of the State relying on ground water for drinking water, and the need for development of ground water resource data in the State.~~

~~(4) Grants made under this subsection shall not exceed 75 percent of the costs of implementing the assessment in any fiscal year, and shall be made on the condition that non-Federal sources provide at least 25 percent of the costs of the activities receiving funding under this section.~~

~~(b) GRANTS FOR PLANNING AND PROGRAM MANAGEMENT.— (1) The Administrator shall make grants to States for~~

~~the purpose of assisting the States in the implementation of sections 5, 7, 8, and 9 of this Act.~~

~~(2) There are authorized to be appropriated for grants under this subsection $50,000,000 for each of the first 5 fiscal years beginning after the date of the enactment of this Act.~~

~~(3) The amount appropriated for each such fiscal year for grants under this subsection shall be apportioned among the States by the Administrator on the basis of the geographic area of the State, the percentage of the population relying on ground water for drinking water, and the extent and seriousness of ground water contamination in such State. The Administrator shall establish a minimum grant amount in order to assure that each State has sufficient grant assistance to develop an adequate ground water program.~~

~~(4) Grants made under this subsection must be matched by the State on a dollar-for-dollar basis with State funds to be used in carrying out sections 5, 7, 8, and 9.~~

~~(c) LIMITATIONS ON GRANTS. (1) States may use funds from grants made pursuant to this section for financial assistance to persons only to the extent that such assistance is related to the costs of demonstration projects.~~

~~(2) No grant shall be made to a State under this section unless the Administrator determines, on the basis~~

~~of-information-provided-by-the-State-and-from-other-relevant sources,--that--the--State--is--implementing--the--provisions of-this-Act-satisfactorily.~~

~~(3)---The--Administrator--may--request--such--information, data,--and--reports--as--he--may--deem--necessary--to--make--the determination--of--continuing--eligibility--for--grants--under this-section.~~

GENERAL AUTHORIZATION

SEC. ~~11~~ 10. ~~(a)---GRANTS.-----There--are--authorized--to be-appropriated-for-grants-under-section-10~~

~~(1)--$75,000,000--for--each--of--the--first--3-fiscal years--beginning--after--the--date--of--the--enactment--of this-Act;-and-~~

~~(2)-$50,000,000-for-each-of-the-following-2-fiscal years.~~

~~(b)~~. ADMINISTRATIVE COSTS. - There are authorized to be appropriated to the Environmental Protection Agency for administrative costs of implementing the activities required in Section 4 of this Act ~~$25,000,000--for--each of-the-first-5-fiscal-years~~ $10,000,000 for the first fiscal year, $10,000,000 for the second fiscal year, and $5,000,000 for the third fiscal year, beginning after the date of the enactment of this Act. These funds are supplemental to any funds provided to the Environmental Protection Agency under the statutes named in Sec.5(f) .

WATER RIGHTS

Sec.11. Nothing herein shall diminish, lessen, or otherwise modify State authority to regulate water use and allocate water rights. Nothing herein shall authorize the impairment of existing water rights.

Testimony
by
The Western States Water Council
regarding
National Ground Water Legislation
Submitted to the
Senate Committee on Environment and Public Works
Subcommittee on Water Resources, Transportation and Infrastructure
and
Subcommittee on Hazardous Wastes and Toxic Substances
February 23, 1988

My name is Craig Bell and I am the Executive Director of the Western States Water Council. The Council is an organization comprised of representatives appointed by the Governors of sixteen western states. Council members consider a broad range of issues related to the management, protection, and development of water resources in the West. We are therefore grateful for the opportunity to present our views on the subject of national ground water legislation. With the assistance of a special subcommittee, the Council continues to consider its position with regard to national ground water policy, and further policy statements and proposals will likely be forthcoming. My statement today is based on principles enunciated in previous Council policy positions and a Council report on the subject. Copies of the Council's previous positions are attached to this statement for your reference. We did not have sufficient opportunity to prepare written responses to the questionnaire, but have encouraged our member states to submit such responses for the record of these hearings.

As is true throughout the Nation, ground water is a critically important natural resource in the West. While the vast majority of ground water use in the western states is for agricultural purposes, ground water is also an important source of water used in industry and mining. Further, half the citizens in the West depend on ground water for their municipal needs. In some areas, the figure is much higher. I believe Westerners, by and large, appreciate the significance of ground water and are willing to take the steps necessary to assure that it is of sufficient quality to allow for its continued beneficial use.

Ground water management - the protection of its quality and its allocation for beneficial use - requires careful coordination among all levels of government. Historic federal policies have emphasized the primacy of states in admininstering ground water allocation and quality protection. Consistent with this policy of deference, the western states have established permitting programs to govern ground water rights and have developed or adopted various legal mechanisms to protect the quality of the ground water within their borders.

The Western States are geographically and economically diverse. Understandably, western state legal institutions for the protection of ground water quality differ. However, it is important to realize that all western states have established such institutions. Some state plans categorize ground waters into classes and establish standards, both discharge and ambient, aimed at protecting each class. Some designate critical ground water recharge areas and formulate regulations aimed at their protection. Regulation of the underground injection of hazardous waste is accomplished in all states either under the federal Underground Injection Control Program or pursuant to state injection control laws. Regional enforcement mechanisms are included in some state ground water protection programs as are public notice and participation practices with regard to permitting activities. Some states are formulating programs to address previously unaddressed sources of ground water contamination.

In addition to state ground water quality programs, virtually all western states have legal schemes to govern ground water allocation. Generally, an application must be made before a well may be drilled. A state administrative official or agency will rule on the application based on factors which differ from state to state. Once a permit is issued, the permittee has a legal right, considered a constitutionally protected property interest, to withdraw a certain amount of ground water for beneficial uses.

There is widespread agreement that states should continue to have the exclusive responsibility with regard to the creation and administration of ground water rights. It follows that any proposal for federal ground water legislation must be carefully constructed so as not to interfere with the states' prerogative and ability to manage and protect ground water rights.

With regard to ground water quality, any proposals for federal ground water legislation should recognize that ground water protection is the primary responsibility of the states, and should be supportive of the states' role. It would be inappropriate for Congress to enact ground water legislation mandating that state programs meet rigid requirements and criteria which may not be applicable in the West. Any national policy should be built upon individual state strategies and responsibility for ground water use, management, and protection.

Western states are carrying out their responsibilities to protect ground water in a number of different ways. Further, a number of states are currently restructuring their programs. The Western States Water Council has published a report entitled Western States Ground Water Management, which contains a state-by-state summary of ground water quantity and quality programs for fifteen western states. I will submit with my testimony today a copy of this report so that it may be included as part of the record of this hearing. The report is an update of a similar report which was written in 1982. Another revision may be necessary in the near future because of the projected changes in many state ground water programs. In the Council's view, the western states are actively engaged in carrying out their responsibility to manage and protect ground water resources. National policy should seek to support and enhance these efforts.

Notwithstanding present state capabilities and a number of federal laws and programs aimed at protecting ground water resources, the sponsors of various federal ground water bills believe that their proposals are necessary to adequately protect the Nation's ground water. As this and the other committees and subcommittees of Congress consider such legislation, the following principles should be given consideration in addition to those previously enumerated.

First, any federal policy should provide the necessary flexibility for the states to develop programs appropriate for their own circumstances with foundation elements which include: (1) aquifer protection standards or alternative criteria to protect all beneficial uses of ground water; and (2) implementation of strategies and mechanisms appropriate to assure ground water protection.

Second, the federal role should be designed to be in support of and in accord with state ground water management and protection programs. Any federal funds provided should be available for development and implementation of state ground water quality programs, not just program development. Otherwise, states that have already developed programs are ineligible for funding.

Third, federal technical assistance should be enhanced under any new legislation. Where some state programs have been less effective than others in achieving ground water protection goals, the underlying problem has nearly always been the lack of technical and financial resources. Any new federal funding for ground water efforts should be directed particularly towards providing increased technical support.

Fourth, any new federal ground water legislation should seek to insure a "good neighbor" policy that requires all federal agencies to conduct their activities which have the potential to affect ground water quality in accordance with state ground water protection programs. Federal lands constitute a majority of all lands within the several western states. Some of the most troublesome ground water contamination problems which currently exist in the West are directly the result of federal activities on federal land. I have attached to my testimony a brief description of some of these problems.

I would like to reiterate that the members of the Western States Water Council hold as a high priority the commitment to work with Congress and others, to encourage efforts at the federal and state levels that support, not undermine, override, or otherwise impair the successful administration of state ground water management programs. Federal programs should be carefully tailored to support the states in their efforts to carry out ground water quality laws, as well as carefully designed to avoid interference with constitutionally protected property rights to use ground water.

The Council has urged each of its member states to examine its ground water protection program, and, where needed, to take all steps necessary to insure that the program is fully effective in protecting all national and state interests in ground water quality within the state. The most effective ground water quality protection programs will be tailored to meet specific needs which vary from state to state and which may be different from one area of the country to another. Site and situation specific management practices are most effective in protecting ground water quality. State and local programs are best able to carry out such practices.

The Council recognizes that these recommendations are based on active, assertive, effective state protection and management efforts. With the federal government providing appropriate support, the Council is confident that each of its member states will meet the challenge of providing these essential efforts. You may be assured that the Council supports that objective.

RESOLUTION
OF THE
WESTERN STATES WATER COUNCIL
CONCERNING
GROUND WATER POLICY

McAllen, Texas
January 14, 1983

WHEREAS, a draft proposed ground water policy has been developed by EPA and submitted to the Cabinet Council on Natural Resources and Environment for review; and

WHEREAS, western states have extensive ground water planning and management experience, recognize the importance of ground water resources to the national health and welfare, and realize the exigency of protecting ground water for present and future needs; and

WHEREAS, the draft policy outlines federal and state roles -- recognizing the central and critical role of the states in future efforts to protect this resource; and

WHEREAS, the states have heretofore had limited input in development of the draft policy.

NOW THEREFORE BE IT RESOLVED, that the Western States Water Council strongly urges EPA to more actively seek state participation in any future decision making, particularly with respect to implementation of any policy; and

BE IT FURTHER RESOLVED, that the Western States Water Council strongly supports the following concepts, which are incorporated in the draft policy, and urges their adoption:

(1) State and Local Governments have responsibility for ground water management, both quantity and quality.

(2) Any national ground water policy must be a joint federal/state effort, also recognizing the role of local and regional (interstate) government units.

(3) Any national policy should be built upon individual state strategies and responsibility for ground water use, management and protection.

(4) The states should be allowed maximum flexibility in developing voluntary state strategies which recognize state and regional differences within federal statutory constraints.

(5) Any national policy should coordinate program activities of all federal agencies with ground water responsibilities.

(6) The role of the federal government should be limited to federal/state cooperative programs and to providing technical assistance in (a) assessing the extent of ground water contamination problems, (b) data gathering and data management, (c) maintaining a strong and productive research program, and (d) facilitating information exchange.

POSITION
# of the
WESTERN STATES WATER COUNCIL
Regarding
GROUND WATER PROTECTION
April 13, 1984

WHEREAS, ground water is a precious and highly valued natural resource upon which our nation relies for a wide range of beneficial uses; and

WHEREAS, ground water management - the protection of its quality and its orderly, rational allocation and withdrawal for various beneficial uses - requires the highest quality coordination of efforts among all levels of government; and

WHEREAS, consistent with historic, federal policies emphasizing the primacy of states in the administration of water allocation and quality protection, the several western states have ground water allocation and protection programs in their laws; and

WHEREAS, recognizing the need to improve significantly the implementation of these state laws, all of the states have or are capable of pursuing actions to insure that improvement objective is reached; and

WHEREAS, taking into account the urgent need to protect ground water quality, Congress is now considering a number of bills with various thrusts relating to said protection; and

WHEREAS, several of these congressional proposals contain elements that would increase the federal role in ground water administration in a fashion that may well undermine the aforementioned state programs; and

WHEREAS, the national administration, through its Environmental Protection Agency, is about to initiate a ground water strategy that contains a significant potential, if not carefully developed and implemented, to undermine the primacy of the very state ground water programs the national administration so strongly espouses.

NOW, THEREFORE, in light of the foregoing, the Western States Water Council resolves that it:

1. Urges Congress, in its consideration of proposed ground water legislation, to limit enactments to those proposals which are faithful to and supportive of the primacy role of state administered programs; and

2. Urges the National Administration, in its implementation of a ground water strategy through the EPA and other agencies, to tailor its efforts so as to insure they are supportive of the primacy role of these state programs; and

3. Gives a high priority commitment to work with Congress and the National Administration, in a spirit of cooperation and goodwill, to bring about enactments and strategies at the federal level that support, not undermine, override or otherwise impair, the state primacy policy and the successful administration of state programs; and

4. Urges every member state to examine its ground water protection program and, when needed, to take all steps necessary to insure that it is fully effective in protecting all national and state interests in ground water quality within the state; and

5. Urges every member state, working in coordination with its sister states and this Council, to make a similar commitment to that set forth in Resolution 3 hereof.

The chairman is directed to provide copies of the resolution to all members of congressional delegations of the member states, the President, the Secretary of the Interior, the Administrator of the Environmental Protection Agency, and the Western Governors' Association.

WESTERN STATES WATER COUNCIL
Statements of Principle Regarding Federal Ground Water Quality Legislation

April 11, 1986

The Western States Water Council supports the following principles relating to federal ground water quality legislation.

Section 1. Policy

A. Ground water quality protection is the primary responsibility of the states.

B. The federal role should be one of support and back-up.

Section 2. Ground Water Quality Protection - Criteria and Standards.

A. States shall have the responsibility to set standards of water quality, based upon beneficial uses - present and future.

B. State standards shall be approved as federal standards unless they do not meet national public health requirements.

C. Federal standards shall be set within a state only if a state does not set standards as provided in A. above and only as they relate to ground water quality standards for the protection of public health.

Section 3. Ground Water Quality Protection - Strategy and Mechanisms.

A. States shall establish strategies and mechanisms that are appropriate for protecting ground water within their borders.

Section 4. Federal Role.

A. Federal actions shall be designed to be in support of and in accord with state programs of sections 2.A and B. and 3.A.

B. Federal funds, with few strings, shall be provided to states for development and implementation of their ground water quality programs.

C. Federal technical assistance and training of personnel in state ground water management programs shall be provided.

D. Notwithstanding any provisions of any federal statute (regulatory or remedial), e.g., RCRA, CERCLA, CWA, SDWA, TSCA, except in emergency situations, no federal agency shall take any action pertaining to ground water protection unless it first obtains a certification from a state that:

  1) The federal action is consistent with state objectives, standards, and strategies for protection of its ground water; and

  2) The federal action will not duplicate regulatory or remedial actions of a state - actively pursued or to be pursued within the reasonable, foreseeable future.

GROUND WATER CONTAMINATION IN THE WESTERN STATES ASSOCIATED WITH FEDERAL LANDS

The following list contains some examples of ground water problems associated with federal lands and federal activities in the Western United States. It is offered as an appendix to testimony presented by Craig Bell, Executive Director, Western States Water council, at hearings on national ground water policy held by the Water and Power Subcommittee of the Senate Committee on Energy and Natural Resources, June 18, 1987.

Arizona

Five federal reservations in Arizona have significant, documented ground water contamination problems. Four of these are in or adjacent to heavily populated areas. One, the Navajo Army Depot, is not located in a densely populated area. Williams and Luke Air Force Bases are in or adjacent to Phoenix. Davis-Monthan Air Base is in Tucson and the Yuma Marine Corps Air Station is in Yuma. The ground water contamination at the sites has occurred as the result of defense-related activities.

California

A number of federal reservations in California have ground water pollution problems related to toxic contaminants. They are are as follows:

Region 2 - San Francisco Bay Region: Alameda NAS, Alameda; Moffit NAS, Mountain View; Travis AFB, Fairfield

Region 3 - Central Coast Region: U.S. Penitentiary, Lompoc; U.S. Army, Fort Ord; U.S. Air Force, Vandenberg AFB

Region 4 - Los Angeles Region: Pacific Missle Test Center, Pt. Magu, Ventura Co.; U.S. Navy Fuel Depot, Van Nuys

Region 5 - Central Valley Region: Mather AFB, Sacramento County; McClellan AFB, Sacramento County; LeMoore NAS, King County; Castle AFB, Merced County; Beale AFB, Yuba County; Sharpe Army Depot, San Joaquin County; Sacramento Army Depot, Sacramento County; USDA, Fresno, Fresno County

Region 6 - Eastern Sierra Region: China Lake Naval Weapons Center, Kern County; Ft. Irwin National Training Center, San Bernardino County; Edwards AFB, Kern County; USMC Logistics Base, San Bernardino County; George AFB, San Bernardino County

Region 7 - Colorado River Region: USMC Base, Twentynine Palms, San Bernardino County; USDI, Joshua Tree National Monument, San Bernardino County

Region 8 - Santa Ana Region: U.S. Naval Weapons Center, Orange County; March AFB; USMC, Tustin Air Station;Norton AFB, San Bernardino County

Region 9 - San Diego Region: USMC, Camp Pendleton

Colorado

The most serious ground water problems in Colorado have to do with federal activities and federal facilities. The most significant one, which is one of the most polluted spots in the Nation, is the Rocky Mountain Arsenal where contamination goes back to nerve gas production during World War II. The state has sued the Department of the Army in federal court over contamination at the site. The suit is pending. From the state's point of view, some progress is being made in cleaning up the site.

Two other sites where serious ground water problems exist are Rocky Flats, where nuclear by-products have caused ground water contamination, and the Martin Marietta site. Rocky Flats is owned by the Department of Energy and managed by Rockwell, International. The United States Air Force owns some land at the Martin Marietta site, although most is owned by Martin Marietta. Virtually all of the company's work is done under government contract in military and space programs.

These three sites encircle the city of Denver. All are within the "five county metro area." The contamination which has occurred is severe.

In addition to sites mentioned, it is likely that operations at Army depots located in Colorado Springs and Pueblo, Colorado, have caused ground water contamination.

Idaho

Five sites at the Mountain Home Air Force Base have been identified as having either contaminated ground water or as posing serious threats to ground water. The sites are a fire training pit, a former landfill now used as a sewage treatment lagoon, an entomology lab, an existing landfill, and an historic petroleum spill.

Another federal facility in Idaho, the Idaho National Engineering Lab, has significant ground water contamination. The lab is operated by the Department of Energy. The Defense Department also has work being performed there. Monitoring indicates that radioactive waste disposed of in an injection well, and handled at sites around the well, has created a defined plume of contamination below the site. So far, the plume has not migrated off from federal land. However, it may in the future. A major contaminant in the plume has a relatively short half-life and radioactive decay may reduce its radioactivity before it migrates off-site. Some of the other contaminants, however, are longer-lived isotopes.

Nevada

Preliminary tests indicate that at least two federal sites in Nevada have ground water contamination problems. One, the former Stead Air Force Base (now a private base) is located just north of Reno. The concern is over past disposal practices of cleaning solvents which likely contaminated ground water. The other site is the Fallon Naval Air Station. Initial data from this site indicates problems associated with cleaning solvents and the potential for hydrocarbon contamination.

North Dakota

Arsenic has been detected in some public drinking water supplies in Lidgerwood, Rutland, and Wyndmere, North Dakota. Ground water sampling in the area indicates varying levels of arsenic, with some unusually high levels. Records show that arsenic-laced grasshopper bait, provided with federal funds and under cooperative agreements between the state and the U.S. Department of Agriculture, was used heavily in the area in the 1930's. Research performed by the state indicates that ground water contamination from disposed bait could be taking place, but no disposal site has yet been confirmed. A probable point source of contamination, located at a former bait mixing site, will require further investigation.

Oregon

The Ordinance Army Depot is located near the City of Hermiston, in northern Oregon on the Columbia River. The depot has been a storage area for nerve gases and other chemical weapons and has been used as a neutralization area for some arms. These federal activities have led to demonstrable ground water contamination in the area.

Utah

Ground water contamination from the storage of solvents in open ponds and leaking drums located at Hill Air Force Base has led to contamination of ground water both on and off from the base. A number of toxic chemicals have been detected in test wells. Also, severe ground water overdraft problems have occurred because of activities at the base. For years, the Air Force refused to obtain ground water permits from the state for pumping on the base.

Ground water contamination has also occurred at the Tooele Army Depot. The major cause is cleaning solvents which have been used by the Army. Significant on-site contamination has been detected, and off-site migration has also occurred. TCE is one of the contaminants most often found in test wells in and around the depot.

Washington

Many areas in Washington State have ground water contamination problems caused by activities on federal land. For example, in the Tacoma area severe contamination has resulted from activities at Fort Lewis and McCord Air Force Bases. A number of drinking water wells were affected by the contamination. In one instance, a water district that serves 25,000 people had to discontinue operation until a treatment facility could be put on line. Also close to Tacoma is the McNeil Island site, a former federal prison (now leased by the state), which has serious ground water contamination problems.

On Whidbey Island two sites on the Navy Air Station, Ault Field and the Seaplane Base, have been contaminated with solvents. Also, the Navy Base at Bangor is contaminated with TNT and the Navy Undersea Station at Keyport is contaminated with solvents and heavy metals. Other military facilities are also suspected of having caused ground water contamination.

In eastern Washington the Department of Energy's Hanford reservation has 1,000 potential sites with ground water problems and 200-300 sites with known contamination. The reserve covers hundreds of square miles. Ground water at the Department of Agriculture's pesticide lab at Yakima is contaminated with pesticide residue of various types.

INTERSTATE CONFERENCE
ICWP
ON WATER POLICY

955 L'Enfant Plaza, S.W., Sixth Floor
Washington, D.C. 20024
(202) 466-7287

EXECUTIVE DIRECTOR
AND GENERAL COUNSEL
Joan M. Kovalic

CHAIRMAN
John N. Morris
Director
Division of Water Resources
North Carolina Department of Natural
Resources and Community Development
P.O. Box 27687
Raleigh, NC 27611
(919) 733-4064
FIRST VICE CHAIRMAN
Dirk Hofman
Deputy Director
Division of Water Resources
New Jersey Department
of Environmental Protection
401 East State Street
Trenton, NJ 08625
(609) 292-1090
SECOND VICE CHAIRMAN
John F. Fraser
Executive Director
and General Counsel
Association of California
Water Agencies
910 K Street, Suite 250
Sacramento, CA 95814
(916) 441-4545
SECRETARY-TREASURER
Robert Morgan
State Engineer
Utah Department of
Natural Resources
1636 West North Temple
Salt Lake City, UT 84116
(801) 533-6071
PAST CHAIRMAN
James R. Barnett
Executive Director
Oklahoma Water Resources Board
1000 N.E. 10th Street
P.O. Box 53585
Oklahoma City, OK 73152
(405) 271-2555
BOARD OF DIRECTORS
Dr. R. Daryl Banks
Deputy Commissioner
Environmental Quality
New York Department
of Environmental Conservation
50 Wolf Road
Albany, NY 12233
(518) 457-3768
Z. "Bo" Bolourchi
Chief
Water Resources Section
Louisiana Department of
Transportation and Development
P.O. Box 94245
Baton Rouge, LA 70804
(504) 379-1434
Wayne T. Haas
Administrator
Resource Analysis Division
Department of Water Resources
Statehouse
Boise, ID 83720
(208) 334-4437
Ronald M. Nargang
Director
Division of Waters
Minnesota Department of
Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4032
(612) 296-4800
Holly Stoerker
Executive Director
Upper Mississippi River
Basin Association
415 Hamm Building
408 St. Peter Street
St. Paul, MN 55102
(612) 224-2880
Jerry D. Vineyard
Assistant State Geologist
Division of Geology
and Land Survey
Missouri Department of
Natural Resources
P.O. Box 250
Rolla, MO 65401
(314) 364-1752
Randy Young
Director
Arkansas Soil and Water
Conservation Commission
One Capitol Mall, Suite 2-D
Little Rock, AR 72201
(501) 371-1611

TESTIMONY
OF
THE INTERSTATE CONFERENCE ON WATER POLICY

NATIONAL GROUNDWATER LEGISLATION
(S. 20, S. 1105, and H.R. 791)

PRESENTED BY

JOHN N. MORRIS, ICWP CHAIRMAN
AND
JOAN KOVALIC, ICWP EXECUTIVE DIRECTOR

Joint Hearings of the Senate
Subcommittee on Water Resources, Transporation and Infrastructure
and
Subcommittee on Hazardous Wastes and Toxic Substances

February 23, 1988

The Interstate Conference on Water Policy (ICWP) is the independent national association of state, interstate, and regional water administrators concerned with water quantity and quality management, conservation, and development. Since 1959, ICWP has been the voice for state water management concerns, particularly with regard to the relationship between state and federal programs, regulatory authority, and information exchange. ICWP offers the following testimony on national groundwater legislation including general principles, comments on legislative proposals, and response to the committee's questionnaire.

GENERAL PRINCIPLES

ICWP recognizes the importance of a safe and abundant supply of drinking water and encourages the protection of groundwater quality and quantity to meet both present and future needs. Groundwater protection must be based on two fundamental premises:

1) Groundwater sources should be protected through prevention of contamination, recognizing that it is most often prohibitively costly and technically difficult to rehabilitate aquifers once they are contaminated.

2) The major purpose of groundwater protection efforts is ultimately to control ambient source quality to limit the cost of required treatment. This principle recognizes that groundwater resources vary in both existing quality and use and will be treated for the use to which they will be applied.

In addition, ICWP believes that a number of major principles should govern the development of federal groundwater legislation and the formulation of national groundwater strategies:

1) The primary responsibility for groundwater management resides with state and local governments. While states cannot meet the challenge alone, they must be able to retain primacy over the management and regulation of groundwater resources.

2) A national groundwater protection strategy is critically needed. However, a national strategy is not synonymous with a federal strategy which must be carefully crafted to include only those elements which are within the appropriate purview of the federal government. A national strategy would recognize the distinct but coordinated efforts of all levels of government including federal, state, and local.

3) Federal groundwater efforts must be tailored to meet the needs of state and local authorities. It is at the state and local level that management, regulatory, and land use decisions are made which affect the quality and quantity of our nation's groundwater resources. Groundwater data collection and analysis efforts must be designed to provide the types of information which are truly useful to state and local authorities. In addition such groundwater data and analysis must be readily available and accessible to those with management and regulatory responsibility.

4) The most appropriate and important role for the federal government to play in groundwater resource management is in the area of research and technical assistance. Major research efforts are often beyond the capability of individual states' resources and may be unnecessarily duplicative unless coordinated at the federal level. Of particular concern is research and technical assistance on the health effects of contaminants.

5) Federal groundwater legislation should avoid being overly prescriptive. Flexibility must be retained to recognize the differing physical, climatic, legal, and social factors which distinguish groundwater basins across the country.

6) Existing and future federal groundwater initiatives should be coordinated and integrated to precisely define the responsibilities of various federal agencies, to avoid duplication of effort and to efficiently utilize limited research dollars.

LEGISLATIVE PROPOSALS

ICWP has not conducted an exhaustive review of the full array of legislative proposals affecting federal groundwater efforts. However, ICWP offers the following comments on specific bills which, although preliminary and incomplete, are indicative of some of the state members' general concerns.

Research bills
H.R. 791/S. 1105

A strong federal commitment to groundwater research and technical assistance is of the highest priority. Both H.R. 791 and S. 1105 lay out a very comprehensive research program to be administered by EPA, USGS, and other federal agencies. While ICWP strongly endorses increased funding for groundwater data collection, improved support for groundwater research and technology transfer, and accelerated research and development of maximum contaminant levels for drinking water, it is difficult to relate the extensive provisions of these research bills to existing federal research efforts. For instance, the research programs authorized in S. 1105 amount to approximately $285 million per year. However, it has been noted by the bill's sponsors that only about one-third of that represents new authority. It is difficult if not impossible to determine which proposed activities are indeed new. A general concern about the research proposals is that they may permit a significant amount of duplicative research unless care is given to specifying the relationship between new federal initiatives and existing research efforts.

One of ICWP's primary concerns with federal research efforts is that they be conducive to the data needs of state and local authorities who have management and regulatory responsibilities. With regard to USGS responsibilities, this is clearly articulated in Section 205(b)(2) and 205(d) of H.R. 791 and Section 202(b)(2)(F) of S. 1105. The philosophy is less apparent in the sections of the legislation which address EPA research responsibilities.

In addition to fundamental research, technical assistance should be a primary component of federal groundwater responsibilities. In this regard, ICWP strongly supports Section 208 of H.R. 791 which authorizes and directs both USGS and EPA to establish a program of technical assistance to state and local governments through grants, loans, cooperative agreements, and contracts. Other than Section 103 which authorizes EPA to provide financial assistance specifically for demonstrations of control technologies, it does not appear that S. 1105 includes a specific comprehensive provision addressing the need for technical assistance for state and local authorities.

ICWP supports provisions for additional funding for water resources research institutes contained in both H.R. 791 and S. 1105. However, it is unclear why the establishment of 5 institutes (H.R. 791) or 4 institutes (S. 1105) is particularly appropriate. In any case, ICWP believes that it is important to clarify that the proposed groundwater institutes be established within the framework of existing water resources research institutes. Many of the existing state water resources research institutes have distinquished records in groundwater research and could provide the facilities and research leadership that are necessary.

Both H.R. 791 (in Section 207) and S. 1105 (in Section 104) direct EPA to undertake significant research efforts on groundwater contaminants including the publication of risk assessments or criteria. This kind of information is vitally important to the state's ability to adequately manage groundwater resources. It is precisely the type of role that is appropriate for the federal government because it requires expertise and financial resources that are beyond the capabilities of state and local governments even though it is information of prime importance to the regulatory community. However, it is unclear how the provisions of Section 104 of S. 1105 relate to similar provisions in Section 4 of S. 20. Furthermore, it is unclear how these specific provisions for groundwater contaminant criteria relate to the maximum contaminant levels (MCLs) to be developed under authority of the Safe Drinking Water Act. In any case, the schedules for criteria development and publication in all three groundwater bills appear to be overly ambitious. If, indeed, Congress is committed to such an accelerated effort in contaminant risk assessments, EPA must be provided with sufficient personnel and funding to meet such a schedule.

Both H.R. 791 and S. 1105 provide for the establishment of a national groundwater information clearinghouse. While ICWP support such a concept, ICWP endorses the establishment of an independent institutional mechanism to integrate, coordinate, and disseminate groundwater research. To vest the authority for information dissemination in a single agency is to inherently foster a nonintegrated approach to satisfying data needs. Similarly, the operation of the clearinghouse should not be vested in any existing center which may have narrowly defined interests. This may be the case if the clearinghouse is operated, as suggested by Section 402 of S. 1105, by the National Groundwater Information Center. This center is operated by a trade organization for the nation's water well construction industry.

S. 20

Many states have already developed extensive groundwater management and protection program while others are just getting underway. While S. 20 provides an opportune offer of financial and technical assistance for these state activities, sufficient flexibility must be maintained. Care must be taken in prescribing both state program requirements and grant allocation formulas so that states with existing groundwater protection strategies are not penalized.

S. 20 appears to recognize that groundwater has a variety of uses which directly affect management and protection needs. For instance, Section 2 establishes a policy of protection for "drinking and other uses." Section 4(a)(2) authorizes criteria and risk analysis of contaminants "with respect to various uses." Similarly Section 5(b)(3) allows state standards to vary "according to the specific use of the special groundwater system." However, one of the factors to be used in apportioning the funds available for state grants in Section 10 is the percentage of the state's population relying on groundwater for drinking water. Such inconsistencies in the bill's underlying philosophy should be remedied.

In general, S. 20 fails to adequately recognize the interrelationships of groundwater quality and quantity. Section 6(a)(4) makes provision for state assessment programs to address quantity issues "if quantity will have a substantial impact on the design of programs to protect groundwater quality." However, the provisions requiring state management strategies (Section 7) and state monitoring programs (Section 8) deal exclusively with groundwater quality. Management of groundwater resources includes more than just protection of quality. The use of a strictly quality focus for the term management in S. 20 may result in difficulties in establishing the institutional framework for implementing the program in states which define management in terms of both quantity and quality. Federal groundwater legislation should foster a comprehensive approach to management recognizing the fragmentation of responsibilities that may exist in some states. However, federal legislation should not intrude upon the states' authority in matters of water quantity and allocation.

S. 20 requires states to establish groundwater quality standards (Section 5), prepare an assessment of groundwater resources (Section 6), develop a groundwater management strategy (Section 7), establish a monitoring program (Section 8), and establish a protection program (Section 9). Both the sheer magnitude of these efforts and their inherent interrelationships require a realistic and integrated schedule of deadlines. Upon ICWP's initial examination, it appears that some timing adjustments may be necessary.

For example, the Section 7 management strategies must be completed within 24 months. However, the Section 6 groundwater assessments which would presumably be of direct benefit in developing management strategies are not required to be completed for 30 months. Similarly, Section 8(c) requires states to submit reports to EPA summarizing groundwater quality and trends and describing the status of compliance with standards established under Section 5 within 30 months. However, the state groundwater monitoring programs to be established under Section 8 are not required to be established until 36 months after the date of enactment. In addition, all timetables should recognize that many state legislatures only meet every two years. It may be difficult to meet many of the time limitations in S. 20 given the fact that the establishment or restructuring of necessary state programs will require significant attention and major action by state legislatures. Finally, with regard to scheduling, many of the periodic review requirements such as those in Section 5(e)(4), Section 7(b)(3), Section 8(c)(1), or Section 9(b)(4) are too frequent. Groundwater conditions are slow in changing and thus do not justify such frequent reexamination, particularly if on-going monitoring efforts are in place.

ICWP strongly supports the Advisory Panel established under Section 4(e) to provide guidance to EPA on the priorities, scheduling, and format of contaminants criteria. This type of approach will help to insure that EPA efforts meet the needs of state and local authorities with regulatory responsibilities. Provision for an Advisory Panel is preferable to the provisions of H.R. 791 and S. 1105 which do not appear to include a means for EPA to receive the advice and counsel of state agencies on their research programs, particularly with regard to contaminants.

Section 5 requires states to establish standards for contaminants found in groundwater. Section 5(b)(3) allows those standards for special groundwater systems to vary according to use. In addition to being based on risks to human health, Section 5(b)(3) should provide for the standards to be based on "the natural background of groundwater quality." Such a provision would recognize that standards must realistically be related to naturally-occurring contaminant conditions if those standards are to ever be achieved.

Section 5(d) requires states to establish specific methods for determining compliance with groundwater standards. The concept of compliance with groundwater quality standards is fallacious. Compliance is a term which has meaning with regard to regulations. States could determine compliance with specific regulatory provisions which affect quality but could not determine compliance with regard to quality standards themselves. It may be more appropriate to use the term "attainment" to reflect the need to measure achievement of the standards.

Section 5(e)(3) requires EPA review of groundwater standards proposed by states. No federal review would seem warranted unless the state standards were different from the federal criteria.

Section 5(f) stipulates that standards established by the states shall apply as the standard of cleanup or control under federal programs. While this provision may offer consistency in federal programs and recognition of varying state conditions and preferences, it may be useful to evaluate the questions this provision raises in terms of liability if any standards other than federal criteria are proposed by states.

Section 8 requires states to establish a program of monitoring with respect to groundwater resources. Subsection (a)(2) requires that such monitoring be designed to identify emerging or future contamination sources. While such a monitoring program will provide data on the types and concentration of contaminants, a groundwater monitoring program alone could not identify sources of contaminants without significant additional investigation.

Section 9 requires states to establish a groundwater protection program. Subsection (a)(5) specifies that the state program may include programs established under federal law. The list of applicable federal statutes should be expanded to include, at a minimum, the Clean Water Act and the Resource Conservation and Recovery Act. In addition, the section should specifically make provision for the required state protection programs to include existing state and local programs. A survey of state protection programs conducted by ICWP in August of 1987 indicates that most states already or will soon regulate in most of the serious groundwater quality problem areas. These is a fairly uniform incidence of regulation in several areas: drinking water monitoring, landfills, wastewater lagoons, pesticide distributor registration and reporting, septic tanks, disposal of hazardous wastes, land application of sewage sludge, investigation of potential contamination, and injection wells. There are a few noticeable omissions, such as fertilizer distribution and use. The continued seriousness of groundwater quality problems, therefore, probably does not stem merely from a lack of regulation or program implementation but rather may be attributable to a whole host of related problems such as lack of information about contamination and lack of funding to properly address the problems leading the list.

Section 10 authorizes grants to states to fulfill their responsibilities under the provisions of Sections 5 through 9. The criteria for allocating grant funds is based in part of Subsection (a)(3) on "the need for development of groundwater resource data in the State," and in Subsection (b)(3) on "the extent and seriousness of groundwater contamination in such State." Both of these criteria are vague and will require subjective judgments by an unidentified party. Furthermore, these criteria have the effect of penalizing those states who have already devoted substantial state resources to groundwater assessment and/or protection strategies.

RESPONSE TO COMMITTEE'S QUESTIONNAIRE

Question #1 (Need for Federal Legislation):

ICWP believes that the strongest need for federal groundwater legislation lies in the areas of research, technical assistance, and funding assistance to support existing programs. In August 1987 ICWP conducted a survey of state views on a number of groundwater issues including the need for additional federal groundwater legislation. Of the 48 responding states, 47 felt legislation was necessary for research and development, 44 felt such legislation was necessary to provide funding assistance for existing programs, and 42 felt legislation was needed to provide states with federal technical assistance.

A federal groundwater statute need not weaken other existing federal groundwater programs if it is carefully crafted to address only those issues not adequately covered by existing programs or if it contains specific provisions regarding how those existing programs are to relate to the new statute. The weakness of existing proposals (H.R. 791, S. 20, and S. 1105) appears to be their lack of specificity with regard to whether the programs they authorize are in addition to existing programs or whether they represent consolidation of existing programs. For instance, S. 1105 authorizes the expenditure of approximately $285 million per year. However, the bill's sponsors note that only about one third of that represents new authority. It is therefore difficult to determine which proposed activities are indeed new. Similarly S. 20 references various other federal programs in some sections but the integration of the new requirements of S. 20 with existing programs is certainly not exhaustive nor precise.

Question #2 (Primary Responsibility):

States and local units of government must retain primacy over the management, protection, and regulation of groundwater resources. If a national goal is to be established it should provide sufficient flexibility for states to be responsive to the differing physical, climatic, legal, economic, and social factors which distinguish groundwater basins across the country. A strict federal nondegradation policy would not allow such flexibility and would be virtually unattainable in most areas. Finally, if a national goal of any sort is to be articulated, it should not be the responsibility of any single agency but should be done so directly by Congress which is both accountable to and open to public dialogue.

Question #3 (Federal Permits or Source Controls):

The protection and management of groundwater resources will require a variety of approaches depending on the source of contamination. While permits may be effective in controlling point sources, various source controls may be necessary for other contamination problems such as nonpoint pollution resulting from pesticide or fertilizer application. States should have the flexibility of designing protection strategies that are best suited to the groundwater resources and contamination problems within their state. Federal prescriptions for groundwater protection are both unnecessary and unfeasible.

Question #4 (Coordination):

ICWP favors coordination of federal groundwater programs by a statutorily designated committee such as the Interagency Groundwater Research Committee authorized by Section 204 of H.R. 791. If the President is to have coordination responsibility, provision should be made for an interagency approach to preclude assignment of such responsibility to a single federal agency. Sound public policy suggests that research and regulatory functions should be sufficiently separate to avoid undue bias of either. However, provision should be made for coordination of both to insure that research efforts yield information of use to the regulatory community and to insure that regulators have the benefit of information on technological developments.

As a final observation, it may be worth considering a coordination strategy based on the execution of Memoranda of Understanding (MOU) between major federal groundwater agencies. Such an MOU was executed in June 1985 to formalize cooperation between EPA and the Department of Interior in the area of groundwater quality. It addresses such issues as data collection and areal investigation, technical assistance, research, and the High Plains States Groundwater Demonstration Program in particular.

Question #5 (Federal Agency Roles):

There is no reason to believe that groundwater research must be confined to a single federal agency when there is such a diversity of research needs and when agencies such as USGS, EPA, and USDA all have unique research capabilities and areas of expertise. The USGS research role should involve the physical characteristics of groundwater including the nature, extent, causes, and transport of contaminants. EPA's research role should involve the health and environmental effects of contaminants including techniques for prevention, treatment, and mitigation of groundwater contamination. The U.S. Department of Agriculture should be involved in aspects of groundwater research related to sources of agricultural contamination including fertilizer and pesticide use.

Question #6 (University Research):

As previously discussed ICWP believes that the establishment of groundwater research institutes should be related to existing water resources research institutes. Requirements for federal/state funding matches deserve further examination. ICWP has consistently supported maintaining the grants at a dollar-for-dollar matching level rather than gradually increasing the non-federal match to 2-to-1 as currently provided in P.L. 98-242. Because the research institutes program emphasizes national and regional research priorities, there is a preselected federal interest which argues strongly for equivalency as the financial matching arrangement.

Question #7 (Assessments):

The USGS National Water Quality Assessment (NAWQA) Program is currently in a pilot phase with an evaluation of the potential utility of a full-scale national program anticipated by 1990. It is unclear how the NAWQA program relates to the various national assessments authorized in S. 1105 and H.R. 791 in particular. It may be prudent to await the results of the NAWQA evaluation to be conducted by a committee of the National Academy of Sciences before authorizing duplicative or alternative national-scale assesssments. Assessments of such scope are both time consuming and expensive and should not be undertaken lightly. ICWP is particularly concerned about the relationship of the national assessments authorized by both Section 106 of S. 1105 and Section 205 of H.R. 791 to the individual state assessments required by Section 6 of S. 20. Individual state groundwater assessments could be quite valuable. On the other hand, nationwide assessments have the potential of being overly generalized offering little information relevant to state or local regulatory officials. Assessments at any scale are expensive endeavors and duplication of effort must be avoided.

Question #9 (Groundwater Depletion):

The federal government should confine its involvement with groundwater depletion to the area of research. The USGS demonstration groundwater recharge program in the 17 western states has the potential for being useful if expanded to a national scale.

Question #10 (State Land Use Controls):

In general regulation of land use remains the responsibility of local units of government. However, ICWP's survey of state groundwater programs indicates that 23 states have special land use controls in recharge or wellhead protection areas.

Question #11 (Funding Priorities):

As previously discussed ICWP believes the three top priority groundwater areas are research and development, technical assistance, and funding assistance to support existing programs. Of particular importance is research to identify the human health effects, risks, and tolerance levels for various contaminants.

Question #12 (State Groundwater Programs):

In response to a special request from Congressmen Nowak and Stangeland of the House Subcommittee on Water Resources of the Committee on Public Works and Transportation, ICWP developed a questionnaire to elicit information on various groundwater issues and problems from its member states. The response rate was outstanding with 48 states completing the questionnaire. Copies of the survey results are included as part of ICWP's testimony. The survey should provide additional insights into the extent of various specific groundwater quality and quantity problems, the focus of existing state groundwater quality and quantity legislation, institutional problems, and the states' views on the need for additional state and/or federal legislation.

Interstate Conference on Water Policy

Statement of Policy
1987-1988

A National Voice
in Water Since 1959

4. INTERRELATIONSHIP BETWEEN WATER QUANTITY AND WATER QUALITY

ICWP believes water quantity and water quality must be considered together. Water resources management implies meeting the water supply needs of the people while preserving and enhancing the water resources for their long-term continuing use and enjoyment. ICWP believes that water quantity and water quality planning and management must be closely coordinated at both the federal and state levels.

A. GROUNDWATER MANAGEMENT:

The nation's welfare is dependent upon a safe and abundant supply of good quality water. The states have long recognized that groundwater management programs must assure the protection of groundwater to meet present and future needs. Many states have already developed extensive groundwater planning and management programs to meet these needs. ICWP encourages interstate cooperative efforts by involved states to conserve and manage common groundwater resources.

However, effective state programs have often been hampered by federal programs that are administered through separate federal agencies with little or no coordination. Often such programs fail to recognize the interrelationships between land use and groundwater, between water quantity and quality, and between surface and groundwater. Therefore, ICWP believes that groundwater protection must be based on two fundamental premises.

First, groundwater sources should be protected through prevention of contamination recognizing that it is most often prohibitively costly and technically difficult to rehabilitate aquifers once they are contaminated. Secondly, groundwater resources used for public supply and industrial processes will almost always be treated for the use to which they will be applied. Thus a major purpose of groundwater protection efforts is ultimately to control ambient source quality and limit the cost of required treatment.

ICWP recognizes that better coordination and integration of federal programs affecting groundwater, with particular emphasis on technical and financial assistance and research and development, could greatly assist state programs.

ICWP believes that a national groundwater protection strategy is critically needed. Such a national strategy would recognize the distinct but coordinated efforts of all levels of government including federal, state, and local. A national strategy is, however, not synonymous with a federal strategy which must be carefully crafted to include only those elements which are within the appropriate purview of the federal government.

ICWP will support federal legislation on groundwater provided that the legislation recognizes and builds upon the fundamental State responsibility in this area. States must be able to retain primacy over the management, protection, and regulation of groundwater resources. Federal legislation should be directed toward general goals and research and technical assistance efforts beyond the capability of individual state resources. In addition, federal legislation must be flexible enough to recognize the differing physical, climatic, legal, and social factors which distinguish groundwater basins across the country.

ICWP believes the Ground Water Protection Strategy and the well head protection efforts of EPA are a positive step towards achieving coordination of groundwater activities. ICWP will support the strategy as long as the procedures adhere to the following objectives and limitations:

(1) Involve all federal agencies with programs that affect, directly or indirectly, groundwater management and provide for active state participation and input;

(2) Build upon the basic state responsibility for groundwater use, management, protection, support and encourage state exercise of such responsibility, and coordination with local interests;

(3) Be directed toward general rather than specific policy or procedural matters. The strategy should include research, technical assistance at the request of the state, data gathering, and financial and other assistance as may be needed by the individual states; and

(4) Be flexible enough to recognize the differing historical, geological, hydrogeological, climatic, legal, current degree of regulatory control and social factors governing the various groundwater basins in the nation.

ICWP believes that states must be involved in the review of groundwater programs from the beginning of such a review, with the nature of the involvement developed in consultation with the states and not predetermined by a federal agency. ICWP will actively encourage participation in any effort which meets these basic requirements. However, ICWP will actively oppose any federal groundwater strategy effort that will interfere with the states' ability to manage their water resources in a manner best suited to their citizens' needs. As such, ICWP strongly opposes the creation of a National Groundwater Commission.

It is ICWP's view that rather than focusing limited federal resources on the formation of a National Groundwater Commission, it is far more important to develop federal actions which would: Research and Develop Maximum Contaminant Levels (MCL's) for drinking water on an accelerated bases, increase funding for groundwater data collection, support groundwater research and technology transfer, provide for coordination of existing federal programs which impact groundwater, and provide for consultation with the states in establishing national goals. All of the activities mentioned above can be started through existing authorities, agencies and programs.

"GROUNDWATER"
TESTIMONY OF THE AMERICAN WATER WORKS ASSOCIATION BEFORE A JOINT HEARING SENATE SUBCOMMITTEE OF WATER RESOURCES, TRANSPORTATION AND INFRASTRUCTURE SENATE SUBCOMMITTEE OF HAZARDOUS WASTE AND TOXIC SUBSTANCES

BY

THOMAS J. BUCHANAN
CH2M HILL
P.O. BOX 4400
Reston, VA

Good morning (afternoon) Senator. I'm Tom Buchanan, a member of the Consultant firm of CH2M Hill, here today representing the American Water Works Association (AWWA) as part of that organization's Technical Assistance Work Group on Groundwater.

The AWWA appreciates this opportunity to be a part of the deliberations on the critical issue of groundwater. As you know, the AWWA is a 106-year-old scientific and educational association which is the largest association of professional drinking water people in the world. We have over 43,000 members which include utility operators, engineers, scientists, professors, health regulators, environmentalists, and many others that have a genuine interest in drinking water. Our membership also includes over 3,000 utilities which supply about 70% of the nation's drinking water.

I am particularly delighted to be here today since I spent a major part of my life dealing with groundwater issues with the United States Geological Survey (USGS) retiring in 1986. I have also spent many years of active involvement with groundwater issues with AWWA and see a great deal of groundwater concerns in my current role with CH2M Hill, one of the Nation's leading consultants on environmental matters. However, realizing the local nature of most groundwater issues, I've brought a couple of folks with me to deal with specific questions and answers: Louis Mirando of the Long Island Water Corporation, New York and Bevin Beaudet of Palm Beach County Water, Florida.

My statement represents a set of recommendations by the American Water Works Association (AWWA) concerning the protection and usage of groundwater. Groundwater protection, recharge and withdrawal issues are extremely complex and impact a wide spectrum of interested parties. Many new groundwater issues will emerge as the discussion becomes more specific and as other parties become involved. As the groundwater discussion continues in the months and years ahead, AWWA will continue to develop groundwater position statements to reflect our interests as suppliers of the nation's drinking water. We were involved in groundwater discussions surrounding the Safe Drinking Water Act, are currently involved with groundwater issues in FIFRA, and will continue to push our views on Water Quality Act, RCRA and SARA issues.

The AWWA supports the principle that water of the highest quality be used as a source of supply for public water systems. Therefore, a primary concern of AWWA is the protection of groundwater resources which now, or in the future, may serve as a source of public, private, or industrial supply. AWWA's principle objective is to provide drinking water of unquestioned quality at an affordable price. This objective requires keeping our source water clean. Enforcement of effluent limitations upon waste discharges alone will not keep our source water clean. Groundwater is vulnerable to contamination from diverse sources including, but not limited to: hazardous waste disposal, accidental leaks and spills, residential septic tanks, agricultural applications of fertilizers and pesticides, leaking underground storage tanks, highway de-icing salts and other industrial and public discharges.

The effective management of groundwater which is the last of this nation's environmental resources to receive pollution control attention will require innovative management strategies and the joint committment and cooperation of federal, state, and local agencies and water purveyors. New technologies will be required to isolate contamination and, where necessary, to remove or treat it.

Everyone must recognize that the assimilative capacity of groundwater for contaminants is far less than that of surface water. Furthermore, the treatment and prevention of contamination must be coordinated with other land, air, and water resource management programs. It is far more effective to prevent contamination of groundwater and properly manage it as a long-term resource than it is to clean it up. The forecasted cost of superfund over the next 5 years will certainly attest to the cost of clean up and that is only the beginning.

The AWWA has a series of recommendations which should be incorporated in pending legislation consideration. We know that many of these are already incorporated in pending legislation, however, we appreciate the opportunity to emphasize their importance here once again:

RECOMMENDATIONS

1. State and Federal Management Roles:

State and local governments should have the primary responsiblity for the management of groundwater resources because groundwater quality and usage varies dramatically across the country. State and local governments are in the best position to assess the local economic, social, and environmental impact that groundwater management policies will create. The AWWA recognizes that some instances exist where interstate and international conflicts can occur regarding groundwater (e.g., aquifer contamination, aquifer depletion, and aquifer recharge), however, these conflicts seldom involve more than two neighboring states and should be resolved at the state level.

Federal involvement in the management and protection of groundwater should be focused on development of health-based drinking water standards, national research needs, review and encouragement of state programs, groundwater monitoring for research purposes, and, where necessary, clean-up of critical aquifers for potable water. The Federal role also extends to establishing specific contaminant identification and general groundwater contaminant allowable levels — all in answer to the question of "how clean is clean?" The federal government with the assistance of the impacted state, should also take the lead role in resolving international groundwater issues which arise with Mexico or Canada.

2. Groundwater Protection:

States, with federal guidance and technical assistance, should classify aquifers based on present and future use of the groundwater which considers the ambient water quality characteristics and develop protection and enhancement mechanisms. Sources of contamination that degrade groundwater quality should be identified, regulated, and eliminated where technically and cost-effectively feasible -- and again it is cheaper to keep our groundwater protected than it is to clean it up. AWWA supports the short-term requirements for the registration and monitoring of underground storage tanks, landfills, hazardous waste disposal sites, hazardous waste lagoons, and industrial discharges and the remediation of all leaking underground storage tanks and hazardous waste lagoons. In addition, states and the federal government should address other major regionalized sources of groundwater contamination, including the application of fertilizers and pesticides to fields and de-icing salts and dust control to highways. Groundwater contamination problems created by septic tanks must also be addressed by state and local governments.

In the long-term we must find solutions other than burying our waste or using quick fixes to immediate problems of pest control or dust.

A groundwater classfication strategy adopted by a state or local agency should encompass one or more components including ambient water quality standards for selected aquifers, designation and delineation of protected aquifer areas, controls on sources of contamination and restrictions on land use over critical aquifers and recharge zones. The goal of these programs should be the implementation of an environmental protection program to ensure that aquifer zones are not carelessly degraded.

3. Groundwater Quality Standards:

AWWA believes that the most important use of groundwater is for drinking and all groundwater standards must be linked to drinking water standards. Therefore, an aquifer's quality should be protected based on drinking water standards, unless the aquifer is naturally or irreversibly contaminated. For those groundwater aquifers which cannot reasonably be expected to ever be used as a drinking water source, AWWA recommends that the development of standards for alternative uses (e.g., industrial or agricultural) be the responsibility of state and/or local governments based on regional and local needs. However, these standards must insure no danger of contaminating other sources or potential sources of drinking water.

In the case of artificial recharge, AWWA feels that existing drinking water standards are not adequate to ensure protection of the aquifer. Recharge waters may contain unacceptable levels of unregulated contaminants, yet, meet the drinking water standards at the same time. AWWA believes that recharge water should be scientifically assessed to assure that the risk to the public is minimized. Water quality standards for recharge waters must weigh several factors including health risks and benefits, existing aquifer water quality, designated use of the aquifer and treatment costs before recharge.

4. Groundwater Quantity:

Groundwater quantity issues are an important concern in formulating a national groundwater protection strategy. Control of withdrawals from groundwater sources should be based on knowledge of aquifer capabilities. Withdrawals of groundwater to levels of near depletion should be eliminated. The Association supports artificial recharge as an increasingly important technology for sustaining groundwater supplies in areas where groundwater depletion is occurring. The AWWA also recommends that all withdrawal of groundwater be metered and controlled in critical areas in order to prevent aquifer depletion. Conservation measures should be implemented and enforced in these areas.

5. Restoration/Remediation of Contaminated Groundwater:

Any groundwater protection policy should consider the clean-up of contaminated aquifers that are the only reasonable source of drinking water for human consumption. Where aquifers do not supply drinking water for human consumption, nor will supply it in the future, it is less important that these aquifers be restored to quality, based on drinking water standards.

Any program established to remedy groundwater contamination must be based on sufficient technical understanding of the resource itself, the availability of other sources of potable drinking water to users, and the economic and technological practicalities of restoring the resource. The federal and state governments must increase efforts to find technological solutions to restoring groundwater quantity and quality. AWWA also recommends that efforts be made by the states or local health agencies to monitor and/or test residential well water supplies where contamination is suspected. However, just knowing what is a hazard in groundwater is NOT enough -- hazards must be identified before they get into the resource -- then kept out.

6. Need for Federal Legislation:

Federal legislation is needed to increase research funding, to develop training and guidance programs for states, to act as a centralized source of groundwater information, to develop health-based drinking water standards and related groundwater standards, to clean-up critical aquifers for potable water, and to encourage and monitor state management programs.

7. Federal Fiscal and Technical Assistance:

Increases and reallocation of existing technical and fiscal resources at all levels of the government is urgently needed to ensure implementation of groundwater protection policies and strategies. A large increase for research efforts associated with the protection, monitoring, treatment, remediation and restoration of groundwater resources is critical. This will require coordination of research efforts between different levels of government. The AWWA recommends that the U.S. Geological Survey's role in assessing the status of groundwater be expanded to provide more emphasis and information on groundwater quality and quantity and that adequate Federal funds be provided for this research, study and information dissemination.

8. Federal Programs Coordination:

AWWA urges Congress to clearly identify the roles of all federal agencies involved in groundwater issues. A clearly defined agenda will reduce duplication of effort and lack of coordination in federal groundwater programs resulting in better allocation of scarce resources. We cannot afford to put our critical groundwater resource in jeopardy because of duplication of effort or lack of coordination.

9. Water Utility Role:

AWWA encourages water utilities to initiate local and state groundwater management programs where the programs do not exist and to become active participants in any ongoing programs. Water utilities and their customers have the most to gain from groundwater protection, therefore, the water utility must become an active participant in any groundwater management program.

The water utilities fully understand their responsibility as the final barrier of protection for our drinking water consumer. They'll get the water safe and of unquestioned quality — but they need everyone's help in keeping our sources clean and protected — otherwise, that glass of crystal clear, safe water will become unaffordable to some or unavailable to all.

The AWWA and I appreciate this opportunity to testify today and I am available for your questions.

American Water Works Association

February 29, 1988

The Honorable Daniel Patrick Moynihan
Chairman, Subcommittee on Water
Resources, Transportation and
Infrastructure
Senate Committee on Environment and
Public Works
Washington, DC 20010-6175

Dear Senator Moynihan:

The American Water Works Association was pleased to take part in your joint hearings on groundwater with the Subcommittee on Hazardous Wastes and Toxic Substances.

In addition to the testimony given by our representative Thomas Buchanan and the comments by Louis Mirando and Bevin Beaudet, we offer the attached comments on each of your Groundwater Questionnaire questions.

I hope that our organization can continue to work with the Congress in quest of our common goal: adequate drinking water of unquestionable quality at an affordable price.

Sincerely,

John H. Sullivan
Deputy Executive Director
Government Affairs Office

JHS/drl

Enclosure

GOVERNMENT AFFAIRS OFFICE 1010 Vermont Ave N.W., Suite 810, Washington, D.C. 20005 [illegible]

GROUNDWATER QUESTIONNAIRE

1. Is there a need for federal groundwater legislation or are other federal statutes adequately addressing this need (esp. SARA, RCRA, SDWA, CWA).

Comment: There are sufficient laws on the books requiring enforceable regulations. States need help and guidance in implementing groundwater programs not more laws. We need to evaluate what we have and consider possible legislation to promote enhanced research and integration (or coordination) of federal programs.

— Would a federal statute weaken other existing federal programs for groundwater?

Comment: Certainly has the protential of weakening existing programs, thus any integration or coordination should only be legislated if total program improvement is a sure thing.

— What efforts could be made to integrate and strengthen all these statutes?

Comment: Perhaps establishing fixed functional responsibilities with a single agency in charge of overall policy and direction and an active coordinating body (Committee or Council) would help. Also better coordinating of programs within each agency is called for. A task group of federal, state, and utility representatives should sit down with congressional staffers to discuss this in depth before any action.

2. Should the primary responsibility for groundwater management reside with State and local governments, or should there be a national goal set by the federal government? If there is to be a national goal, which agency should set it and what should it be?

Comment: The primary responsibility and authority should reside with the states. There should probably be a broad national strategy with guidance for the states regarding both aquifer protection and clean up.

— Should there be a strict federal nondegradation policy, a limited one, or should the states decide on nondegradation?

Comment: Degradation is a local and state issue, thus the states should decide on nondegradation and other groundwater standards issues.

3. Do you support federal groundwater permits based on water quality criteria or federal source controls based upon potential for groundwater contamination?

Comment: Federal permits are not called for, however, states should have the flexibility to consider this mechanism in their strategy without infringing on local processes.

— If so for what sources?

N/A

4. How should the activities of Federal agencies be coordinated — by a committee designated by statute, a statutorily designated lead agency, or should this be the responsibility of the President?

— In answering please consider whether there should be one lead agency for research and another for regulation.

Comment: Each federal agency should have a statutorily designated set of functions for the various programs (e.g. groundwater) and overall "lead" functions should certainly be designated; e.g. EPA should certainly have the lead on regulatory issues (strategy and guidance) with USGS handling resource evaluation and monitoring. However, research is a complex function within any program; in groundwater EPA should probably set overall policy and direction (based on advice from the Science Advisory Board (SAB)), the National Science Foundation (NSF) should probably coordinate who does what research and USGS should assume a major role in occurrence data collection and analysis.

— If there were to be a federal entity to coordinate research among the agencies is there an existing suitable entity? (e.g. FCCSET—The Federal Coordinating Council on Science Engineering and Technology).

Comment: Certainly an existing coordinating body within the NSF could do the job, but whichever body does it must have both the responsibility and the authority to insure that duplication and inefficiency is eliminated.

5. For each of the following functional activities describe the role you see each of the various Federal agencies playing (including the funding and institutional arrangements, where appropriate), regardless of whether you approve of the function itself being carried out by the Federal Government.

a. approving of State plans for assessment, monitoring, protection, or management.

Comment: EPA should be the authority to review state plans to offer assistance to the states regarding federal overall strategy and guidance. This review can be linked to the award of state grants but should NOT be an approval process.

b. providing technical assistance on matters of hydrogeology, resource assessment, resource management, mapping of aquifers or recharge areas, or data management.

Comment: These are clearly in the functional domain of USGS, however, some coordination with other federal agencies may be called for, particularly if research effort is required.

c. providing technical assistance on matters of health effects, criteria setting, mitigation strategies, or remediation strategies.

Comment: These areas could cover several agencies e.g.:

-- Health effects -- public health service should provide the final word with EPA perhaps coordinating.
-- Critical setting -- assistance in this area should be keyed to federal guidance, thus EPA should have the final word.
-- Both strategies mentioned should be handled by EPA with input from several sources such as their labs and USGS.

d. operating an information clearinghouse providing indexing of data, of literature (technical and lay), and of sources of expert advice and services to State and local government.

Comment: A central federal clearinghouse on data to assist states in their groundwater programs is probably best handled by USGS from an overview standpoint with many contributors such as the National Technical information Service for publications, various associations for Library Service (e.g. AWWA's WATERNET), others dealing with technology and USGS itself for physical and hydrological aquifer data as well as water quality data.

e. conducting research on: hydrology, hydrogeology, fate and transport of chemicals in the subsurface, monitoring network design, analysis of the vulnerability of groundwater to contamination.

Comment: As we previously commented, EPA should establish broad policy and direction for research, NSF should coordinate and allocate funding for research and many bodies should conduct the research. For the areas mentioned above, USGS and the states (where the capability exists) should have the lead and should use outside research institues as appropriate in accordance with P.L. 98-242.

f. conducting research and development on techniques for preventing contamination from: agriculture, domestic waste disposal, industry (including extractive industries), and other sources.

Comment: Exactly the same as e above.

g. conducting research on health and ecological effects of contaminants.

Comment: With the same lead in comment as **e** above; the Public Health Service should have the lead for these areas and should use outside research institutes as appropriate.

h. conducting research and development on methods of remediation and treatment of contaminated groundwater.

Comment: Exactly the same as e above.

i. issuing health advisories.

Comment: This should be a functional area within the domain of the Public Health Service with some oversight by EPA.

j. conducting resource assessments.

Comment: These assessments are best suited for the USGS in conjunction with overall EPA policy and directional guidance in order to summarize the full Federal picture.

6. How should the needed university research and educational programs related to groundwater be strengthened (e.g. institutes, fellowships, competitive research grants programs) and how should these be administered?

— The Water Resources Research Act (P.L. 98-242) is authorized through 1989. This Act funds 54 research institutions on a 40/60 federal-state matching basis. How can this program be incorporated into the new groundwater bills?

Comment: There is clearly a continuing need for this program as indicated in comments on 5e above. Perhaps NSF should provide specific recommendations on this with input from USGS, EPA, the University Council on Water Research and perhaps others.

7. Comment on the USGS National Water Quality Assessment Program and how that relates to any of the assessments and studies in S. 20., S. 1105 and H.R. 791.

— Are the time frames for these assessments and studies reasonable?

Comment: There needs to be one qualified body doing Water Quality Assessments— the USGS appears to be the best suited for that role but should operate within the general policy and direction of EPA much as a consultant would. However, time frames for assessments must be reasonable and dictated by the science of the task, not the politics of the moment. Most assessment studies in newly proposed legislation have unreasonable completion times that will simply cause ineffiencency and delay.

8. Comment on EPA's classification scheme and how it relates to each of the three bills.

Comment: EPA's groundwaer classification system oversteps their bounds of authority and is being erroneously interpreted in some programs as the rule rather than a guide. Groundwater standards and any related classification system are the province of the states. However, we must all be careful not to decide today regarding future aquifer use and we must take whatever steps are necessary to protect our drinking water sources of the future. See our testimony on standards setting and the role of the states.

9. To what extent should the federal government concern itself with groundwater depletion? — research only? regulation?

Comment: The Federal government may well get involved in research for the state but depletion is a State or local issue and should remain as such.

10. To what degree are states using land use controls to prevent groundwater contamination?

Comment: Some states are using land use and certainly this functional area belongs at the state or local level. The federal government should use education, grants, persuation and whatever "carrots" are necessary to enhance state involvement — BUT the "stick" of regulation and enforcement should NOT be used.

11. Given limited fiscal resources what are the priority programs and activities to fund in these bills.

Comment: First priority should be toward research and evaluation in order to provide assistance to the states followed by state assistance grants to encourage following federal strategy and direction. Coordination and integration of federal actions should be "funded" by enhanced efficiency.

12. Please point out any exemplary state groundwater programs or add any other comments not covered in your statement.

Comment: California, Florida, Arizona, Connecticut, and recently Virginia have begun significant efforts. It can be done by the states; we should be supporting their efforts.

II

100th CONGRESS
1st Session

S. 20

To provide for the protection of ground water through State standards, planning, and protection programs.

IN THE SENATE OF THE UNITED STATES

January 6, 1987

Mr. **Moynihan** (for himself, Mr. **Burdick**, Mr. **Mitchell**, Mr. **Baucus**, and Mr. **Lautenberg**) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To provide for the protection of ground water through State standards, planning, and protection programs.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

Section 1. This Act may be cited as the "Ground Water Protection Act of 1987".

DECLARATION OF POLICY

Sec. 2. It is the policy of the United States to protect the quality of ground water resources for drinking and other uses.

DEFINITIONS

SEC. 3. For purposes of this Act—

(1) the term "Administrator" means the Administrator of the Environmental Protection Agency;

(2) the term "contaminant" means any manmade or natural physical, chemical, biological, or radiological substance or matter in ground water; and

(3) the term "State" means the 50 States, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, the Northern Mariana Islands, American Samoa, and the Trust Territory of the Pacific Islands.

GROUND WATER QUALITY CRITERIA

SEC. 4. (a) ESTABLISHMENT OF CRITERIA.—(1) The Administrator shall establish criteria for ground water quality with respect to those contaminants found in ground water. Such criteria shall reflect the latest scientific knowledge on—

(A) the physical, chemical, biological, and radiological properties of the contaminant;

(B) the association of the contaminant with various sources of ground water contamination; and

(C) existing and needed research relating to the contaminant.

(2) The criteria established under this subsection shall include an analysis of the risk posed by the contaminant to human health and the environment at various concentrations in ground water and with respect to various uses of the

water. Such analysis for each contaminant shall include a comparison of the risks posed by such contaminant to risks posed by other ground water contaminants.

(b) FORMAT.—The Administrator shall establish and utilize a standard format for presentation of ground water criteria. The format shall be designed to facilitate State development of ground water quality standards under section 5. The format shall include a summary of the research and analysis of the contaminant which shall be understandable to public health professionals who lack training in toxicology.

(c) USE OF AVAILABLE DATA AND ADDITIONAL STUDIES.—(1) In establishing criteria under this section, the Administrator shall use, to the fullest extent practicable, any data or analysis developed, or planned to be developed, by the Agency for Toxic Substances and Disease Registry.

(2) In establishing the criteria under this section the Administrator shall consider criteria, data, and analyses developed pursuant to the Federal Water Pollution Control Act, title XIV of the Public Health Service Act (commonly referred to as the Safe Drinking Water Act), and the Toxic Substances Control Act.

(3) The Administrator shall conduct studies to the extent necessary to establish criteria under this section. Such studies may be conducted in conjunction with the Agency for Toxic Substances and Disease Registry. The Administrator

may use the authorities of sections 4 and 8 of the Toxic Substances Control Act to gather data necessary to establish criteria under this section.

(d) TIMETABLE FOR ESTABLISHING CRITERIA.—(1) The Administrator shall establish criteria under this section for not less than 50 high priority contaminants within 18 months after the date of the enactment of this Act.

(2) The Administrator shall establish criteria under this section for not less than 50 additional high priority contaminants within 30 months after the date of the enactment of this Act.

(3) The Administrator shall establish criteria under this section for additional contaminants on an ongoing basis and at a rate which is consistent with the needs of the States in developing ground water quality standards under section 5.

(e) ADVISORY PANEL.—(1) The Administrator shall, within 6 months after the date of the enactment of this Act, appoint a panel to advise him with respect to the implementation of this section, including (but not limited to) the contaminants for which criteria should be established, the rate at which the criteria should be established, and the quality and format of the criteria documents.

(2) The panel shall be chaired jointly by a senior official of the Environmental Protection Agency, to be selected by the Administrator, and a senior official of the Agency for

Toxic Substances and Disease Registry, to be selected by the Secretary of Health and Human Services.

(3) The panel shall include not less than 5 representatives of State agencies involved with ground water protection, and representatives of other Federal agencies involved with ground water protection, as selected by the Administrator, with the concurrence of the Secretary of Health and Human Services.

(f) RESEARCH ACTIVITIES.—The Administrator shall provide for such additional research activities as he deems necessary to support the effective development and implementation of ground water standards and protection programs. The Administrator shall provide for effective coordination of ground water-related research within the Environmental Protection Agency and among other Federal agencies.

STATE GROUND WATER PROTECTION STANDARDS

SEC. 5. (a) AMBIENT GROUND WATER STANDARDS.—(1) Each State shall establish numerical standards for contaminants found in the ambient ground water. States may establish nondegradation standards for any contaminant or contaminants in the ambient ground water.

(2) Ambient ground water quality standards shall apply uniformly to all geographic areas in the State and all geological structures, unless the area or structure is designated by

the State as a special ground water system under subsection (b).

(3) Ambient ground water quality standards shall, except as otherwise provided in subsection (b) for special ground water systems, be at least as stringent as the primary drinking water standard established under title XIV of the Public Health Service Act (commonly referred to as the Safe Drinking Water Act) for the particular contaminant (if such a standard has been established under such Act).

(b) STANDARDS FOR SPECIAL GROUND WATER SYSTEMS.—(1) The State may identify discrete and defined ground water systems within the State and establish special ground water quality standards for such systems.

(2) Special ground water systems may be defined, to the extent possible, by a specific geographic area or geologic structure. The definition of such system shall be a part of the standard.

(3) Standards for special ground water systems may vary according to the specific use of the special ground water system. Such standards shall be numerical and shall be based on an assessment of the risks to human health and the environment inherent in such uses.

(4) Special ground water systems may include geographic areas or geologic structures associated with uses which may require more stringent standards than those es-

tablished under subsection (a) (such as recharge of a valuable ecosystem) and uses which may require less stringent standards than those established under subsection (a) (such as agriculture, waste disposal, industrial processes, and mining).

(c) ESTABLISHMENT OF STANDARDS.—(1) In establishing standards under subsections (a) and (b), the State shall utilize the criteria established by the Administrator under section 4, and any other data which the State determines to be appropriate.

(2) The State shall establish standards under subsections (a) and (b) for the high priority contaminants for which the Administrator has established criteria under paragraphs (1) and (2) of section 4(d), unless the State determines that such contaminant is not found in such State, and may establish standards for any other contaminants found in the State.

(d) COMPLIANCE.—(1) In establishing standards under subsections (a) and (b), the State shall establish specific procedures and methods for determining compliance with such standards.

(2) The Administrator shall publish guidance and information describing procedures and methods for determining compliance with such standards within 12 months after the date of the enactment of this Act.

(e) TIMETABLE FOR ESTABLISHING STANDARDS.—(1) The State shall propose standards for ambient ground water and for any special systems for those contaminants for which criteria have been established under section 4(d)(1) within 30 months after the date of the enactment of this Act.

(2) The State shall propose standards for ambient ground water and for any special systems for those contaminants for which criteria have been established under section 4(d)(2) within 42 months after the date of the enactment of this Act.

(3) Any ground water standards proposed by the State shall be made available for comment to the Administrator and the public for a period of 6 months. The State shall establish final standards within 12 months after the close of such 6-month comment period.

(4) The State shall review, revise, if necessary, and expand, if appropriate, the standards established under this section not less often than every 3 years. Any proposed revisions or additions to State standards shall be made available for comment to the Administrator and the public for a period of 6 months.

(f) STATE STANDARDS TO APPLY UNDER FEDERAL PROGRAMS.—Any standard established by the State under this section shall apply as the standard of cleanup or control under any Federal program relating to protection of ground water, including (but not limited to) the Solid Waste Disposal

Act and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

GROUND WATER RESOURCE ASSESSMENT

SEC. 6. (a) REQUIREMENTS.—The State shall develop an assessment of ground water resources within such State. Such assessment shall—

(1) be sufficient to characterize ground water resources for management and protection purposes;

(2) provide a baseline for future monitoring of ground water;

(3) provide a basis for identification of special use ground water systems for purposes of section 5(b), and determination of contaminants present in such systems;

(4) focus on ground water quality, but may address ground water quantity if quantity will have a substantial impact on the design of programs to protect ground water quality; and

(5) be developed in consultation with the United States Geological Survey.

(b) TIMETABLE FOR ASSESSMENT.—(1) The Administrator and the Director of the United States Geological Survey shall, after consultation with the States, jointly issue guidance to the States describing the appropriate content and format for assessments under subsection (a) within 12 months after the date of the enactment of this Act.

(2) The State shall complete the assessment under subsection (a) within 30 months after the date of the enactment of this Act.

(3) Upon completion of the assessment under subsection (a), the State shall certify to the Administrator that such assessment meets the requirements of this section, and shall provide copies of the assessment to the Administrator and the Director of the United States Geological Survey.

GROUND WATER MANAGEMENT STRATEGY

SEC. 7. (a) REQUIREMENTS.—The State shall develop a management strategy with respect to ground water resources within such State. Such management strategy shall—

(1) identify a lead agency and provide an institutional framework for protection of ground water quality;

(2) identify major sources of ground water contamination and the contaminants associated with each such source;

(3) assure coordination among Federal, State, and local agencies involved in ground water protection; and

(4) assure coordination of ground water protection programs with surface water protection programs and with the activities of public water supply systems.

(b) TIMETABLE FOR MANAGEMENT STRATEGY.—(1) The State shall complete the development of an initial ground water management strategy under subsection (a) within 24 months after the date of the enactment of this Act.

(2) Upon completion of such strategy development, the State shall certify to the Administrator that such strategy meets the requirements of this section, and shall provide a description of the strategy to the Administrator.

(3) The State shall annually review and, if necessary, revise the management strategy to reflect any relevant change in conditions, and shall provide a description of any revised strategy to the Administrator.

GROUND WATER MONITORING

SEC. 8. (a) REQUIREMENTS.—The State shall establish a program of monitoring with respect to ground water resources within such State. Such monitoring program shall—

(1) be capable of assessing compliance with the standards established by the State under section 5, including standards for special systems established under section 5(b);

(2) be designed to provide periodic assessments of ground water quality trends and to identify emerging or future ground water contaminants and contamination sources;

(3) establish the institutional and agency responsibilities for monitoring; and

(4) establish the methods and procedures for monitoring.

(b) TIMETABLE FOR MONITORING PROGRAM.—(1) The Administrator and the Director of the United States Geological Survey shall jointly prepare a report to Congress evaluating alternative designs for a national ground water quality data management system within 18 months after the date of the enactment of this Act.

(2) The Administrator and the Director of the United States Geological Survey shall jointly, and in consultation with the States, prepare a guidance document for use by States in developing ground water monitoring programs under subsection (a) within 24 months after the date of the enactment of this Act.

(3) The State shall establish a ground water monitoring program under subsection (a) within 36 months after the date of the enactment of this Act.

(4) Upon the establishment of such program, the State shall certify to the Administrator that such program meets the requirements of this section, and shall provide a description of such program to the Administrator and to the Director of the United States Geological Survey.

(c) REPORTS ON GROUND WATER QUALITY.—(1) The State shall submit to the Administrator a report which provides a summary of ground water quality and trends in the State, and which describes the status of compliance with the standards established under section 5, including the standards for special systems established under section 5(b), within 30 months after the date of the enactment of this Act, and biennially thereafter. The State may use the ground water resource assessment submitted under section 6 in lieu of the first report otherwise required under this subsection.

(2) The Administrator may establish reasonable requirements regarding the content and format of reports required under paragraph (1) in order to assure compatability of data at the national level.

GROUND WATER PROTECTION PROGRAM

SEC. 9. (a) REQUIREMENTS.—(1) The State shall establish a ground water protection program which is capable of assuring compliance with the State ground water standards established under section 5.

(2) The State ground water protection program shall include individual elements addressing each source of ground water contamination identified in the management strategy pursuant to section 7(a)(2).

(3) The State ground water protection program shall include program elements addressing the following sources of ground water contamination that are of national concern:

(A) solid waste disposal;

(B) hazardous waste disposal;

(C) underground storage tanks and pipes;

(D) subsurface sewage disposal;

(E) pesticide use; and

(F) underground injection.

States shall, to the extent practicable, review and assess the interactive effects of such sources.

(4) The State may waive the requirement to develop ground water protection program elements identified in paragraph (3) by an affirmative demonstration to the Administrator that the source of contamination is not significant in that State and that ground water quality standards may be attained without establishment of a program for the identified source of contamination.

(5) The State ground water protection program may include programs established under other Federal laws, including the Solid Waste Disposal Act, title XIV of the Public Health Service Act (commonly referred to as the Safe Drinking Water Act), the Federal Insecticide, Fungicide, and Rodenticide Act, and the Federal Water Pollution Control Act.

(6) The ground water protection program elements may utilize regulations, voluntary controls, education, and any other measures which the State deems necessary and appropriate to assure compliance with ground water standards pursuant to section 5.

(7) The Administrator shall, after consultation with the States, provide States with guidance concerning the design, structure, and format of State ground water protection pro-

grams within 12 months after the date of the enactment of this Act.

(b) TIMETABLE FOR ESTABLISHING PROTECTION PROGRAM.—(1) The State shall propose a ground water protection program addressing sources of contamination identified in section 7(a)(2) within 36 months after the date of the enactment of this Act.

(2) The State shall propose a ground water protection program addressing sources of contamination identified in section 9(a)(3) within 48 months after the date of the enactment of this Act.

(3) Proposed ground water protection plans shall be made available for comment to the Administrator and the public for a period of 6 months. The State shall establish a final ground water protection program within 6 months after the close of the 6-month comment period.

(4) The State shall annually review and, if necessary, revise the final ground water protection program to reflect any relevant change in conditions, and shall provide a description of any such revision to the Administrator.

(c) EPA ASSESSMENT OF STATE PROGRAM.—The Administrator may conduct an assessment of a State program (or any program element thereof) developed under this section if the Administrator has reason to believe that the State program (or element) does not comply with the requirements of this section. Such assessment may include public hearings. The Administrator shall report the results of any such assessment, together with recommendations for needed actions, to the State within 6 months after initiating such assessment.

GRANTS TO STATES

SEC. 10. (a) GRANTS FOR GROUND WATER RESOURCE ASSESSMENTS.—(1) The Director of the United States Geological Survey shall make grants to States for the purpose of assisting the States in carrying out ground water resource assessments under section 6.

(2) There are authorized to be appropriated for grants under this subsection $25,000,000 for each of the first 3 fiscal years beginning after the date of the enactment of this Act.

(3) The amount appropriated for each such fiscal year for grants under this subsection shall be apportioned among the States by the Director on the basis of the geographic area of the State, the percentage of the population of the State relying on ground water for drinking water, and the need for development of ground water resource data in the State.

(4) Grants made under this subsection shall not exceed 75 percent of the costs of implementing the assessment in any fiscal year, and shall be made on the condition that non-Federal sources provide at least 25 percent of the costs of the activities receiving funding under this section.

(b) GRANTS FOR PLANNING AND PROGRAM MANAGEMENT.—(1) The Administrator shall make grants to States for the purpose of assisting the States in the implementation of sections 5, 7, 8, and 9 of this Act.

(2) There are authorized to be appropriated for grants under this subsection $50,000,000 for each of the first 5 fiscal years beginning after the date of the enactment of this Act.

(3) The amount appropriated for each such fiscal year for grants under this subsection shall be apportioned among the States by the Administrator on the basis of the geographic area of the State, the percentage of the population relying on ground water for drinking water, and the extent and seriousness of ground water contamination in such State. The Administrator shall establish a minimum grant amount in order to assure that each State has sufficient grant assistance to develop an adequate ground water program.

(4) Grants made under this subsection must be matched by the State on a dollar-for-dollar basis with State funds to be used in carrying out sections 5, 7, 8, and 9.

(c) LIMITATIONS ON GRANTS.—(1) States may use funds from grants made pursuant to this section for financial assistance to persons only to the extent that such assistance is related to the costs of demonstration projects.

(2) No grant shall be made to a State under this section unless the Administrator determines, on the basis of information provided by the State and from other relevant sources, that the State is implementing the provisions of this Act satisfactorily.

(3) The Administrator may request such information, data, and reports as he may deem necessary to make the determination of continuing eligibility for grants under this section.

GENERAL AUTHORIZATION

SEC. 11. (a) GRANTS.—There are authorized to be appropriated for grants under section 10—

(1) $75,000,000 for each of the first 3 fiscal years beginning after the date of the enactment of this Act; and

(2) $50,000,000 for each of the following 2 fiscal years.

(b) ADMINISTRATIVE COSTS.—There are authorized to be appropriated for administrative costs of implementing this Act $25,000,000 for each of the first 5 fiscal years beginning after the date of the enactment of this Act.

II

100TH CONGRESS
1ST SESSION

S. 1105

To authorize a national program of ground water research.

IN THE SENATE OF THE UNITED STATES

APRIL 28 (legislative day, APRIL 21), 1987

Mr. BURDICK (for himself, Mr. DURENBERGER, Mr. MOYNIHAN, Mr. MITCHELL, Mr. BAUCUS, Mr. CHAFEE, Mr. STAFFORD, Mr. BREAUX, and Mr. GRAHAM) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To authorize a national program of ground water research.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act, together with the following table of contents, may be cited as the "Ground Water Research Act of 1987".

TABLE OF CONTENTS

Sec. 1. Short title and table of contents.
Sec. 2. Findings.
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TITLE I—PROGRAMS OF THE ENVIRONMENTAL PROTECTION AGENCY

Sec. 101. Authorities and areas of investigation.

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Sec. 103. Control technologies.
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Sec. 105. Research institutes.
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TITLE II—PROGRAMS OF THE GEOLOGICAL SURVEY

Sec. 201. Amendments to the Organic Act.
Sec. 202. National ground water quality inventory.
Sec. 203. Water resources research amendments.
Sec. 204. Authorities of the Administrator.

TITLE III—PROGRAMS OF OTHER FEDERAL AGENCIES

Sec. 301. Agricultural Research Service.

TITLE IV—GENERAL PROVISIONS

Sec. 401. Special studies.
Sec. 402. National ground water clearinghouse.
Sec. 403. Coordination.
Sec. 404. Patent Policy.
Sec. 405. Authorizations.

FINDINGS

SEC. 2. The Congress finds that—

(a) ground water in the United States is a vast and complex resource comprising 96 per centum of the freshwater available for use;

(b) approximately one-half of the population of the United States and 95 per centum of those living in rural areas rely on ground water for drinking water supplies;

(c) recent surveys by the Environmental Protection Agency and by other agencies and organizations have identified ground water contamination problems in each of the several States including thousands of incidents which have forced abandonment of water supply wells or contaminated public water supply systems;

(d) sources of ground water contamination are diverse, including waste and nonwaste products and activities, point and nonpoint sources, and hazardous and nonhazardous substances;

(e) ground water contaminants are known to cause adverse health and environmental effects and to impose large costs in treatment and remediation;

(f) there is not an adequate effort by the Federal Government or by the States to collect and disseminate data and information concerning the location and characteristics of ground water;

(g) there is not an adequate effort by the Federal Government or by the States to assess the characteristics of ground water contaminants and to evaluate their effects on human health and environmental resources;

(h) there is not an adequate effort by the Federal Government or by the States to investigate, develop and demonstrate methods, practices and techniques that may be effective in preventing, detecting and correcting the contamination of ground water resources; and

(i) current Federal programs of research and development with respect to ground water protection are not adequately coordinated.

PURPOSE

SEC. 3. The purposes of this Act are to—

(a) establish a comprehensive and consolidated program of research, development, and demonstration at the Environmental Protection Agency and at the other agencies of the United States to enhance knowledge of the natural characteristics and processes that govern water in the saturated and unsaturated zones; expand knowledge concerning the location and characteristics of ground water; improve scientific capability to assess, detect, and evaluate the effects on human health and environmental resources of substances that may contaminate ground water; provide for the development and dissemination of practices, methods, and techniques that may be effective in preventing, detecting, and correcting ground water contamination; and collect and disseminate information on the causes, extent, and effects of ground water contamination;

(b) establish priorities and a management system for such research, development, and demonstration;

(c) enhance the internal research capabilities of the Environmental Protection Agency and other agencies of the United States related to the protection, maintenance, and restoration of ground water resources; and

(d) assist other public agencies and authorities, nonprofit institutions and organizations and other persons who are engaged in such research, development, and demonstration.

DEFINITIONS

SEC. 4. As used in this Act—

(1) the term "Administrator" means the Administrator of the Environmental Protection Agency;

(2) the term "Agency" means the United States Environmental Protection Agency;

(3) the term "assistance" means any assistance provided by the Agency pursuant to provisions of this Act in the form of grants, loans, loan guarantees, property, contracts (except those for the procurement of goods and service of the Government of the United States), cooperative agreements or technical assistance, whether the recipient is a State or local government, a nonprofit organization or other person;

(4) the term "contaminant" means any solid, liquid, semisolid, dissolved solid, or gaseous material naturally occurring or anthropogenic chemical, parameter for measurement of water quality, or biological organism which in its original form or as a metabolite or degradation or waste product may impair the quality

of ground water or may have an adverse effect on human health, welfare or the environment as a constituent of ground water;

(5) the term "contract" means any contract, grant, agreement, understanding or other arrangement, which includes research, development, or demonstration work, and includes any assignment, substitution of parties, or subcontract executed or entered into thereunder;

(6) the term "contractor" means any person having a contract with or on behalf of the Administrator;

(7) the term "demonstration" means the initial exhibition of a new technology, process or practice or a significantly new combination or use of technologies, processes, or practices, for the purpose of proving technological feasibility and cost effectiveness;

(8) the term "develop" includes activities which assist in the transfer of technology to users of practices, methods, or techniques which may be effective in preventing, detecting or correcting ground water contamination;

(9) the term "Federal agency" or "agency of the United States" means any department, agency or other instrumentality of the Federal Government, any inde-

pendent agency or establishment of the Federal Government including any Government corporation, and including the Tennessee Valley Authority;

(10) the term "ground water" means water below the land surface in the zone of saturation;

(11) the term "invention" means inventions or discoveries, whether patented or unpatented;

(12) the term "local government" means any city, town, borough, county, parish, district, or other public body which is a political subdivision of a State and which is created pursuant to State law;

(13) the term "made" when used in relation to any invention, means the conception or first actual reduction to practice of such invention;

(14) the term "nonprofit organization" means any organization, association or institution described in section 501(c)(3) of the Internal Revenue Code of 1954 which is exempt from taxation pursuant to the provisions of section 501(a) of such Code;

(15) the term "person" means an individual, trust, firm, joint stock company, corporation (including any government corporation), partnership, association, consortium, joint venture, State, local government, commission, regional agency, interstate agency, or Federal agency;

(16) the term "pesticide" includes any active or inert ingredient of a pesticide product registered according to the provisions of the Federal Insecticide, Fungicide and Rodenticide Act and the metabolities and degradation products of such ingredients;

(17) the term "source" or "source or potential source of contaminants" includes, but is not limited to—

(A) any facility, building, structure, installation, equipment, pipe, pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, tank, or activity which discharges or may discharge contaminants to ground water, or

(B) any site or area where a contaminant has been deposited, stored, disposed of, or placed, or otherwise come to be located so as to allow the discharge of such contaminant to ground water;

(18) the term "State" means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands; and

(19) the term "vadose zone" or "unsaturated zone" means the zone between the land surface and the principal zone of saturation.

TITLE I—PROGRAMS OF THE ENVIRONMENTAL PROTECTION AGENCY

AUTHORITIES AND AREAS OF INVESTIGATION

SEC. 101. (a) AUTHORITY.—The Administrator shall, in consultation and cooperation with the Director of the Geological Survey and with the heads of other appropriate Federal agencies, establish a national research, development, and demonstration program to support the protection, maintenance and restoration of the ground water resources of the United States and as part of such program shall conduct, and promote the coordination and acceleration of research, investigations, experiments, demonstrations, surveys, and studies relating to the causes, sources, effects, extent, prevention, detection, and correction of ground water contamination. In carrying out the provisions of this Act, the Administrator is authorized to—

(1) collect and make available through publications and other appropriate means, the results of and other information (including appropriate recommendations by the Administrator in connection therewith) pertaining to the research, development, and demonstration activities conducted pursuant to this section;

(2) cooperate with other Federal agencies, with the States and with local governmental entities, interstate and regional agencies, other public agencies and authorities, nonprofit institutions and organizations, or other persons, in the preparation and conduct of such research, development, and demonstration activities;

(3) makes grants to the States or to local governmental entities, to other public agencies and authorities, nonprofit institutions and organizations and to other persons;

(4) conduct investigations and research and make surveys concerning any specific problem of ground water contamination in cooperation with any State or local governmental entity with a view to recommending a solution to such problem, if requested to do so by such State or local governmental entity;

(5) enter into contracts (including contracts for construction) or cooperative agreements with public agencies and authorities, nonprofit institutions and organizations, and other persons without regard to sections 3648 and 3709 of the Revised Statutes (31 U.S.C. 529; 41 U.S.C. 5);

(6) conduct, in cooperation with the Secretary of the Department of Health and Human Services, studies, including epidemiological studies of the effects of

ground water contaminants or potential contaminants on mortality and morbidity and clinical and laboratory studies on the immunologic, biochemical, physiological, and the toxicological effects including the carcinogenic, teratogenic, mutagenic, and neurotoxic effects of ground water contaminants or potential contaminants;

(7) develop and disseminate informational documents on ground water contaminants describing the nature and characteristics of such contaminants at various concentrations;

(8) collect and disseminate, in cooperation with other agencies of the United States, and with other public agencies and authorities, nonprofit institutions and organizations having related responsibilities, basic data on the chemical, physical, and biological contaminants that may affect ground water quality and other information pertaining to ground water contamination and the prevention, detection, and correction thereof;

(9) develop effective and practical processes, methods, and techniques for the prevention, detection, and correction of ground water contamination;

(10) construct such facilities and staff and equip them as may be necessary to carry out the provisions of this section;

(11) call conferences concerning the potential or actual contamination of ground water resources giving opportunity for interested persons to be heard and present papers at such conferences;

(12) establish and maintain research fellowships in the Environmental Protection Agency and at public or nonprofit private educational institutions or research organizations;

(13) utilize, on a reimburseable basis, facilities and personnel of existing Federal scientific laboratories and research centers; and

(14) acquire secret processes, technical data, inventions, patent applications, patents, licenses, and an interest in lands, plants, equipment and facilities, and other property or rights, by purchase, license, lease, or donation.

(b) GENERAL AREAS OF INVESTIGATION.—In carrying out the provisions of this section the Administrator (and the Ground Water Research Committee established by section 102 of this Act) shall given priority to research, development and demonstration projects which—

(1) demonstrate the fate and transport of contaminants or potential contaminants in ground water;

(2) develop practices, methods, techniques or processes effective in controlling sources or potential

sources of ground water contaminants with emphasis on sources which discharge or release nonhazardous waste or contaminants not considered to be waste which shall be in addition to similar development activities already conducted pursuant to the Solid Waste Disposal Act (42 U.S.C. 6901, et seq.) and the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601, et seq.) with respect to sources of hazardous waste;

(3) determine the effects on human health and the environment of the contaminants which are or may be present in ground water;

(4) develop analytical procedures for monitoring and evaluating ground water quality and the flow characteristics of aquifer systems;

(5) develop methods or techniques to restore ground water resources that have been damaged by contamination incidents; and

(6) develop practices, methods or techniques effective in reducing the quantity or toxicity of waste materials from the processes or activities which have a potential to contaminate ground water resources.

For purposes of this title the term "develop" shall include research projects, demonstration projects, or activities which assist in the transfer of technology to users of the practices, methods, or techniques identified.

(c) INVESTIGATIONS, STUDIES AND SURVEYS.—The Administrator shall conduct or assist research, investigations, studies, surveys, or demonstrations with respect to (but not limited to) the following—

(1) the effects on human health of contaminants or combinations of contaminants whether natural or anthropogenic that are found in or that are likely to be found in the ground waters of the United States;

(2) the exposure of persons to contaminants that are found in ground water including exposure to such substances from sources other than ground water contamination including air, diet, and workplace exposures;

(3) the effects on the environment including aquatic life, wildlife, and other environmental resources of contaminants that may be found in ground water discharged to the surface;

(4) the hydrologic relationship between surface water and ground water and the likely impact of contamination in one medium on the quality and uses of the other;

(5) methods and techniques for characterizing and modeling subsurface hydrogeology in both the saturated and unsaturated zones;

(6) methods and techniques for characterizing and modeling geographic regions of fractured rock and karstic formations or other unique geologic formations;

(7) the transport and dispersion of particular contaminants in the saturated and unsaturated zones;

(8) the fate, including the degradation and transformation, of particular contaminants in the saturated and unsaturated zones;

(9) methods and techniques to characterize the vulnerability of locations to contamination based on factors including climate, vegetation, topography, soil characteristics, and subsurface hydrology;

(10) methods and techniques to characterize and model zones of influence and wellhead protection areas around water production wells;

(11) methods and techniques for sampling ground water including well construction, sample collection, and the storage of samples before analysis;

(12) methods for detecting and quantifying contaminants in ground water samples including screening methods to improve the efficiency and reduce the cost of analysis;

(13) methods and techniques for monitoring, sampling, and analyzing the discharge from sources or potential sources of contaminants in various categories and subcategories;

(14) methods and techniques for monitoring, sampling, and analyzing contaminants in the unsaturated zone and correlating the results of such methods and techniques with likely future impacts on ground water quality;

(15) the water supply needs of the Nation including water supply for public, agricultural, industrial, and other uses and the impact of water supply needs in the future on available ground water quality and quantity;

(16) methods and techniques of water conservation in household, agricultural, commercial and industrial uses;

(17) processes and technologies to assure the more efficient use of toxic chemicals and other substances which are potential ground water contaminants including pesticide and fertilizer products;

(18) methods and techniques for controlling discharges, whether intentional or accidental, from sources or potential sources of contaminants in various categories and subcategories;

(19) the design and operation of waste treatment systems including septic systems, land treatment systems, and containment systems that minimize the potential for contaminants to reach ground water;

(20) methods and techniques for the closure and postclosure care of sources or potential sources of contaminants to minimize the potential for further discharge of contaminants to ground water;

(21) methods and techniques for the remediation and restoration of contaminated ground water resources;

(22) methods and techniques for the treatment of contaminated water supplies to render such supplies potable; and

(23) methods and techniques for remediation, restoration, and treatment of contaminated ground water resources in the saturated or unsaturated zones utilizing in situ biological, chemical, or physical treatment.

RESEARCH COMMITTEE AND MANAGEMENT PLAN

SEC. 102. (a) COMMITTEE.—In carrying out the functions pursuant to this part, the Administrator shall establish a mediaspecific research committee for ground water resources (in addition to the media-specific research committees already established) to be cochaired by the Assistant Administrator for Water and by the Assistant Administrator for the Office of Research and Development. The membership of the committee established by this subsection shall be broadly representative of the program and research concerns within the Agency related to the protection, maintenance and restoration of ground water resources.

(b) ANNUAL REPORT.—The research committee shall make an annual report, which shall cover a period of at least five fiscal years, summarizing the major research issues concerning the protection, maintenance and restoration of ground water resources as identified by the committee, describing the research accomplishments of the preceding fiscal year, identifying the status of ongoing research, and outlining the ground water research program for the Agency for the three succeeding fiscal years. The annual report of the committee shall serve as the management plan for the ground water research program of the Agency and shall assure the coordination of all research, development and demonstration activities relating to the protection, maintenance, and restoration of ground water resources conducted by the Agency and shall facilitate and accelerate the development of control technologies as authorized by this Act. The annual report shall constitute the basis upon which requests for appropriations to carry out this title are to be made for the succeeding fiscal year.

(c) POLICY DECISIONS.—The annual report required by subsection (b) of this section shall include an itemized list of all major policy decisions affecting all aspects of the protection, maintenance, and restoration of ground water resources which are pending before the Agency or which will arise in the forseeable future and shall specify in a comprehensive manner the type of information relevant to such policy decisions, evaluate the adequacy of available information in each category, and define the research and studies necessary to address the deficiencies in the available information.

(d) CONTROL TECHNOLOGIES.—The annual report required by subsection (b) of this section shall include a description and assessment of each project conducted pursuant to section 103 of this Act.

(e) HEALTH EFFECTS AND RELATED RESEARCH.—The annual report required by subsection (b) of this section shall include a description of the status of health effects and related research for each contaminant listed pursuant to section 104(a) of this Act. The report shall identify any additions to the list and summarize any proposals, including applications, recommendations, or petitions, for listing pursuant to section 104(a)(3) and indicate the disposition of such proposals. The report shall identify the status of all research in progress pursuant to section 104(b) of this Act and the publication of any criteria documents issued pursuant to section 104(f).

(f) ENVIRONMENTAL EFFECTS AND RELATED RESEARCH.—The annual report required by subsection (b) of this section shall include a description of the status of environmental effects and related research for each contaminant listed pursuant to section 104(a) of this Act.

(g) RESEARCH INSTITUTES.—The annual report required by subsection (b) of this section shall describe the research programs of the research institutes established under section 105 of this Act and provide for the coordination of such research programs with other activities conducted pursuant to the authorities of this Act.

(h) REVIEW AND TRANSMITTAL.—The annual report required by subsection (b) of this section shall be submitted in draft form to the Congress, and for review including review by the Science Advisory Board, and shall be available for public comment for a period of sixty days after its submission in draft form. The annual report shall be submitted to the Congress in final form, not later than April 15 of each year, and shall incorporate such needed revisions as arise from comments received during the review period.

(i) RESEARCH MANAGER.—The Administrator shall appoint a Ground Water Research Manager in the Office of Research and Development who shall be charged with carrying out the management plan, as incorporated in the annual report required by subsection (b) of this section, and who shall provide central direction for ground water research within the Office of Research and Development.

CONTROL TECHNOLOGIES

SEC. 103. (a) GENERAL AUTHORITY.—The Administrator is authorized and directed to carry out a program of research, evaluation, testing, development, and demonstration of practices, methods, technologies, and processes which are (or may be) effective in controlling sources or potential sources of ground water contaminants and preventing the occurrence of ground water contamination. In addition to research, development, and demonstration activities conducted by the Administrator pursuant to section 101 and by the research institutes established by section 105 of this Act, the Administrator may enter into contracts or cooperative agreements, or provide financial assistance in the form of grants, to public agencies and authorities, nonprofit institutions and organizations or other persons, to demonstrate such practices, methods, technologies, or processes only if the Administrator finds that—

(1) such contract, cooperative agreement or grant will serve to demonstrate a new or significantly improved practice, method, technology or process or the feasibility and cost effectiveness of an existing, but unproven, practice, method, technology, or process, and will not duplicate other Federal, State, local, or com-

mercial efforts to demonstrate such practice, method, technology, or process;

(2) such contract, cooperative agreement or grant meets the requiremets of this section and serves the purposes of this Act;

(3) the demonstration of such practice, method, technology, or process will comply with all other laws and regulations for the protection of human health, welfare, and the environment; and

(4) in the case of a contract or cooperative agreement, such practice, method, technology, or process would not be adequately demonstrated by State, local, or private persons or in the case of an application for financial assistance by a grant, such practice, method, technology, or process is not likely to receive adequate financial assistance from other sources.

(d) PROGRAM ELEMENTS.—The demonstration program established by this section shall include solicitations for demonstration projects; selection of suitable demonstration projects from among those proposed; supervision of such demonstration projects; evaluation of the results of the demonstration projects which are conducted; dissemination of information on the effectiveness and feasibility of the practices, methods, technologies and processes which are proven effective in controlling sources or potential sources of contaminants through demonstration under this section. The Administrator shall publish regulations to assure satisfactory implementation of each element of the demonstration program authorized by this section.

(c) SOLICITATION.—Within one hundred and eighty days after the date of enactment of this Act, and no less often than every twelve months therafter, the Administrator shall publish a solicitation for proposals to demonstrate, prototype or at full-scale, practices, methods, technlogies, and processes which are (or may be) effective in controlling sources or potential sources of contaminants. The solicitation notice shall prescribe the information to be included in the proposal, including technical and economic information derived from the applicant's own research and development efforts, and other information sufficient to permit the Administrator to assess the potential effectiveness and feasibility of the practice, method, technology, or process proposed to be demonstrated.

(d) APPLICATIONS.—Any person and any public or private nonprofit entity may submit an application to the Administrator in response to the solicitations required by subsection (c) of this section. The application shall contain a proposed demonstration plan setting forth how and when the project is to be carried out and such other information as the Administrator may require.

(e) PROJECT SELECTION.—In selecting practices, methods, technologies or processes to be demonstrated, the Administrator shall fully review the applications submitted and shall evaluate each project according to the following criteria—

(1) the potential for the proposed practice, method, technology, or process to effectively control sources or potential sources of contaminants (including control through improved use, management, storage, handling, transfer, or disposal of contaminants) which present the greatest risk to human health or the environment or present the greatest likelihood of ground water contamination and which are not effectively controlled by existing practices, methods, and technologies;

(2) the capability of the person or presons proposing the project to successfully complete the demonstration as described in the application;

(3) the likelihood that the demonstrated practice, method, technique or process could be applied in other locations and circumstances to control sources or potential sources of contaminants, including considerations of cost, effectiveness, and feasibility;

(4) the extent of financial support from other persons to accomplish the demonstration as described in the application; and

(5) the capability of the person or persons proposing the project to disseminate the results of the demonstration or otherwise make the benefits of the practice, method, or technology widely available to the public in a timely manner.

The Administrator shall select or refuse to select a project for demonstration under this section within ninety days of receiving the complete application for such project. In the case of a refusal to select a project, the Administrator shall notify the applicant within such ninety-day period of the reasons for the refusal. In each twelve-month period the Administrator shall select at least ten demonstration projects for support according to the provisions of this section.

(f) SUPERVISION AND TESTING.—Each demonstration project under this section shall be performed by the applicant, or by a person satisfactory to the applicant, under the supervision of the Administrator. The Administrator shall enter into a written agreement with each applicant granting the Administrator the responsibility and authority for testing procedures, quality control, monitoring, and other measurements necessary to determine and evaluate the results of the demonstration project. The Administrator may pay the costs of testing, monitoring, quality control, and other measurements required by the Administrator to determine and evaluate the results of a demonstration project, including the use of innovative or alternative waste treatment technologies, and the limitations established by subsection (i) of this section shall not apply to such costs.

(g) MONITORING.—The Administrator shall enter into arrangements, wherever practicable and desirable, to provide for monitoring, testing procedures, quality control, and such other measurements necessary to evaluate the results of demonstration projects or facilities intended to control sources or potential sources of contaminants, including hazardous waste treated in situ, whether or not such projects or facilities are constructed and operated under the provisions of this section, for the purpose of obtaining information concerning the performance, and other aspects of such facilities, methods, practices, technologies, or processes. Where the Administrator provides only monitoring and evaluation or personnel and provides no other financial assistance to a facility or project, notwithstanding the provisions of section 404 of this Act, title to any invention made or conceived of in the course of developing, constructing, or operating such facility or demonstrating such practice, method, technology, or process shall not be required to rest in the United States and patents respecting such invention shall not be required to be issued to the United States.

(h) PROJECT COMPLETION.—Each demonstration project under this section shall be completed within such time as is established in the demonstration plan. The Administrator may extend any deadline established under this subsection by mutual agreement with the applicant concerned.

(i) FUNDING RESTRICTIONS.—In providing financial assistance under this section to a demonstration project, the Administrator shall endeavor to enter into agreements and make other arrangements for maximum practicable cost sharing with other Federal, State, and local agencies, private persons or any combination thereof. Total Federal funds for any full-scale demonstration project under this section shall not exceed 75 per centum of the total cost of such project estimated at the time of the award of such assistance. In cases where the Administrator determines, in accordance with criteria established by regulation, that research under this section is of a basic nature which would not otherwise be undertaken, the Administrator may approve grants under this section with a matching requirement other than that specified in this subsection, including full Federal funding.

(j) EQUITABLE DISTRIBUTION.—Not more than 15 per centum of the total funds appropriated for any fiscal year as authorized under this section shall be granted for projects in any one State. The Administrator shall by regulation prescribe the manner in which this paragraph shall apply to a grant under this section for a project in an area which includes all or part of more than one State.

(k) TECHNOLOGY TRANSFER.—In carrying out the demonstration program under this section, the Administrator shall conduct a technology transfer program including the collection and dissemination of information, data and recommendations relating to the practices, methods, technologies and processes for controlling sources or potential sources of contaminants demonstrated under the provisions of this section. The Administrator shall establish and maintain a central reference library for such information. The information maintained by the Administrator shall be made available to the public, subject to the provisions of section 552 of title 5, United States Code and section 1905 of title 18, United States Code, and to other government agencies in a manner that will facilitate its dissemination; except that upon a showing satisfactory to the Administrator by any person that records, reports, or information, or a particular part thereof (except data on discharges), to which the Administrator has access under this section if made public, would divulge methods or processes entitled to protection as trade secrets of such person, the Administrator shall consider such record, report, or information or particular portion thereof confidential in accordance with the provisions of section 1905 of title 18, United States Code, except that such record, report, or information may be disclosed to other officers, employees, or authorized representatives of the United States concerned with carrying out this Act or when relevant in any proceeding under this Act. Notwithstanding any provision contained in this section or any other provision of law, all information reported to, or otherwise obtained by, the Administrator (or any representative of the Administrator) under this Act shall be made available upon written request of any duly authorized committee of the Congress, to such committee (including records, reports, or information obtained by representatives of the Environmental Protection Agency).

HEALTH AND ENVIRONMENTAL EFFECTS AND RELATED RESEARCH

SEC. 104. (a) LIST OF CONTAMINANTS.—

(1) AUTHORITY.—Within six months after the date of enactment of this Act, the Administrator shall prepare and publish in the Federal Register a list of the contaminants which are known to occur (or which may be expected to occur) in the ground waters of the United States. The Administrator shall, from time to time and as necessary to carry out the provisions of this section but not less often than annually, review and revise such list adding other contaminants pursuant to the requirements of this section. The listing of a

contaminant under this subsection is not an agency rulemaking and is not subject to the requirements of section 553 of title 5, United States Code. In considering objections raised in any judicial action, the court shall uphold the Administrator's decision to list or not to list a particular contaminant unless the objecting party can demonstrate that the decision was arbitrary and capricious or otherwise not in accordance with law. The list of contaminants prepared according to the provisions of this paragraph shall not be construed to indicate that those contaminants not listed are safe for human exposure or without adverse environmental effects.

(2) INITIAL LIST.—The initial list of contaminants shall include, but is not limited to, the following—

(A) contaminants for which the Administrator is required to promulgate a national primary drinking water regulation pursuant to the provisions of the Safe Drinking Water Act (42 U.S.C. 300f, et seq.);

(B) other contaminants for which a health advisory has been prepared by the Office of Drinking Water at the Environmental Protection Agency;

(C) contaminants listed according to the provisions of section 104(i)(2) of the Comprehensive Environmental Response, Compensation, and Liability Act and which are known to occur in ground water;

(D) contaminants listed pursuant to section 307(a) of the Clean Water Act;

(E) pesticides which the Administrator determines have the potential to leach to ground water; and

(F) other contaminants known to occur in the ground waters of the United States.

(3) ADDITIONS TO LIST.—

(A) The Administrator shall promptly revise the list of contaminants established by paragraph (1) of this subsection to include any contaminant which is found in ground water samples at three or more locations or which is listed pursuant to section 104(i)(2) of the Comprehensive Environmental Response, Compensation, and Liability Act.

(B) Upon application of the Governor of a State, showing that a contaminant or potential contaminant of ground water which is not on the list established by paragraph (1) of this subsection may be reasonably anticipated to endanger public health, public welfare or the environment as a result of its presence or potential for presence in ground water, the Administrator shall, within ninety days, revise the list established by paragraph (1) of this subsection to include such contaminant or publish in the Federal Register the reasons for not making such a revision.

(C) Within ninety days of receiving a recommendation from the Director of the National Toxicology Program, the Administrator of the Agency for Toxic Substances and Disease Registry, or the Director of the National Institute for Environmental Health Sciences that a particular contaminant be added to the list established by paragraph (1) of this subsection, the Administrator shall revise the list to include such contaminant or publish in the Federal Register a statement of the reasons for not making such revision.

(D) Any person may petition the Administrator requesting that a contaminant or potential contaminant be added to the list established by paragraph (1) of this subsection. The Administrator shall, within ninety days, either grant or deny the petition based on a showing by the petitioner that the contaminant may have an adverse effect on human health, welfare or the environment due to its presence or potential for presence in ground water. If the petition is granted the Administrator shall revise the list established under paragraph (1) of this subsection to include such contaminant.

(b) RESEARCH PROGRAM.—For each contaminant listed according to the provisions of subsection (a) of this section, the Director of the National Toxicology Program in consultation with the Director of the Agency for Toxic Substances and Disease Registry shall, within one hundred and twenty days of the listing of that contaminant, develop and transmit to the Administrator a proposed research program for that contaminant including a description of a program of toxicological testing which in the judgment of the Director is necessary to prepare a criteria document described in subsection (f) for such contaminant. Upon receipt, the Administrator shall publish the proposed research program in the Federal Register and seek comment thereon. Within sixty days after receipt of a proposed research program, the Administrator shall approve such program or make such amendments as the Administrator deems necessary to fulfill the purposes of this Act. The research program developed pursuant to this subsection shall include, but is not limited to—

(1) studies of the chemical and physical properties and characteristics of the contaminant;

(2) studies of the dispersion, persistence, and fate (including the degradation products and metabolites) of the contaminant when released into the environment;

(3) studies of human exposure to the contaminant as a result of its presence in ground water and through other pathways of contact with human populations;

(4) studies (including, but not limited to, laboratory and epidemiological studies) of the health effects of the contaminant (and its degradation products and metabolites) including studies to determine acute toxicity, subacute toxicity, chronic toxicity, and the potential for the contaminant to cause cancer, gene mutations [illegible] birth defects; and

(5) studies of the ecological effects (including the propensity of the contaminant to bioaccumulate when discharged to surface waters) of the contaminant as a result of its presence in ground water.

To the extent practicable the research program developed pursuant to this subsection shall be completed within a two-year period and shall be coordinated with the development of contaminant profiles under section 104(i)(3) of the Comprehensive Environmental Reponse, Compensation, and Liability Act and research under section 104(i)(5) of such Act. Approved research programs shall be transmitted to the States and other interested persons.

(c) REGISTRATION.—

(1) Not later than one hundred and twenty days after the listing of a chemical substance as a contaminant according to the provisions of subsection (a) of this section, each person who manufactures or imports such substance, or who has manufactured or imported such substance in the previous five years, shall register with the Administrator reporting the amount of such substance manufactured or imported in each such year and such other information as the Administrator may prescribe by regulation. Each person who registers according to the requirements of this paragraph shall report to the Administrator in each of the five succeeding years updating the information required to be reported by this subsection.

(2) Each person who begins manufacturing or importing a chemical substance during the five-year period after the date on which such substance is listed as a contaminant under subsection (a) of this section, shall register with the Administrator and during such five-year period shall report annually to the Administrator the amounts manufactured or imported and such additional information as the Administrator may re-

quire. The Administrator may extend the period for reporting provided in this paragraph, if it takes longer than a five-year period to complete the research program for the contaminant with respect to which a manufacturer or importer is registered.

(3) The Administrator may issue an order or bring a civil action in the appropriate United States district court to require compliance with this subsection or subsection (d)(4) by any person who manufactures or imports (or manufactured or imported) a contaminant listed pursuant to subsection (a) of this section. Any person who violates, or fails or refuses to comply with, an order issued pursuant to this paragraph shall be liable to the United States for a civil penalty of not more than $25,000 per day of violation.

(4) Any person who knowingly fails to register or who makes false statements or representations in a registration shall, upon conviction, be punished by a fine in accordance with the provisions of title 18, United States Code, or by imprisonment for not more than one year, or by both.

(d) TESTING.—

(1) Upon approval of the proposed research program of the Director of the National Toxicology Program for any contaminant or potential contaminant

pursuant to subsection (b) of this section, the Administrator shall provide notice to that effect through publication in the Federal Register and mailing to each person who registered as a manufacturer or importer of that substance under subsection (c) of this section. Such notice shall include a description of the research program proposed by the Director of the National Toxicology Program and approved by the Administrator for such contaminant.

(2) If, within ninety days of the publication of the notice, none of the registrants or other persons has, in the judgment of the Administrator, undertaken (or committed to undertake) the described program of research or provided the results of such research, the Administrator, in cooperation with the Director of the National Toxicology Program and the Director of the Agency for Toxic Substances and Disease Registry, shall initiate or assure the initiation of a research program and thereafter conduct and complete the testing or other research included in the research program for such contaminant.

(3) The Administrator is authorized to permit persons who manufacture or import substances listed as contaminants pursuant to subsection (a) of this section

or other persons to provide for technically adequate and timely testing.

(4) In any case in which the Administrator, the Director of the National Toxicology Program or the Director of the Agency for Toxic Substances and Disease Registry has initiated or conducted research for a particular contaminant pursuant to this subsection, the United States may seek reimbursement from the person or persons who manufacture or import such contaminant and who are registered pursuant to subsection (c) of this section to recover all costs incurred in preparing and conducting such research including research conducted pursuant to subsection (e) and costs incurred in the preparation, distribution and revision of criteria documents provided for in subsection (f) of this section. Such persons shall be liable for all such costs. If more than one person is registered as a manufacturer or importer of a particular contaminant pursuant to subsection (c), the Administrator may allocate the costs of the research program for such contaminant among those persons registered according to the volumes reported for each fiscal year or according to such other factors as the Administrator determines will provide for an equitable allocation of the costs. Not later than twelve months after the date of enactment of this

Act, the Administrator shall promulgate regulations to implement this paragraph.

(e) ADDITIONAL RESEARCH.——If, after the conclusion of a research program authorized by subsections (b) and (d), the Administrator determines based on new information that additional research or testing with respect to the same contaminant is necessary, the Administrator may conduct a further program of research which shall be governed by the provisions of this section. In addition to the research program including testing authorized by subsections (b) and (d) of this section, the Administrator is authorized to conduct research, studies (including epidemiological studies), surveys, tests (including toxicological testing), and demonstrations (including demonstrations of treatment technologies) with respect to contaminants or potential contaminants and the detection, prevention, and correction of ground water contamination.

(f) CRITERIA.—Within one hundred and eighty days of completion of the research program conducted pursuant to subsections (b) and (d) of this section, the Administrator shall publish a document containing criteria for each contaminant contained on the list published pursuant to subsection (a). Such criteria shall reflect the latest scientific knowledge on—

(1) the physical, chemical, biological, and radiological properties of the contaminant;

(2) the effects of the contaminant on human health, welfare, and the environment; and

(3) the association of the contaminant with various human activities which have the potential to be sources of the contaminant in ground water.

The criteria published under this paragraph shall include an analysis of the risk posed by the contaminant to human health and the environment at various concentrations in water and with respect to various uses of the water. The Administrator shall establish and utilize a standard format for presentation of ground water criteria published in the documents authorized by this paragraph. The format shall include a summary of the research and analysis of the contaminant which shall be understandable to public health professionals who lack training in toxicology. Criteria documents shall be distributed to each State and be made available to other interested persons. The Administrator may revise criteria documents as needed to reflect new information.

(g) CONFIDENTIALITY OF INFORMATION.—

(1) Any records, reports, or information obtained from any person under this section shall be available to the public, except that upon a showing satisfactory to the Administrator by any person that records, reports, or information, or particular part thereof (other than data on the discharge, health, or safety effects data, or

the items described in paragraph (5)) to which the Administrator or any officer, employee, or representative of the Agency has access under this section if made public would divulge information entitled to protection under section 1905 of title 18, United States Code, such information or particular portion thereof shall be considered confidential in accordance with the purposes of that section, except that such record, report, document, or information may be disclosed to other officers, employees, or authorized representatives of the United States concerned with carrying out this Act, or when relevant in any proceeding under this Act.

(2) Any person not subject to the provisions of section 1905 of title 18, United States Code who knowingly and willfully divulges or discloses any information entitled to protection under this subsection shall, upon conviction, be subject to a fine in accordance with the provisions of title 18, United States Code or to imprisonment not to exceed one year, or by both.

(3) In submitting data under this section, a person required to provide such data may—

(A) designate the data which such person believes is entitled to protection under this subsection; and

(B) submit such designated data separately from other data submitted under this section.

A designation under this paragraph shall be made in writing and in such manner as the Administrator may prescribe by regulation.

(4) No person required to provide information under this section may claim that the information is entitled to protection under this subsection unless such person shows each of the following—

(A) such person has not disclosed the information to any other person, except as required by law, and such person has taken reasonable measures to protect the confidentiality of such information and intends to continue to take such measures;

(B) the information is not required to be disclosed, or otherwise made available, to the public under any other Federal or State law;

(C) disclosure of the information is likely to cause substantial harm to the competitive position of such person; and

(D) the specific chemical identity, if designated for protection under this subsection, is not readily discoverable through reverse engineering.

(5) The following information with respect to a discharge from any source or potential source of contaminants shall not be entitled to protection under this subsection—

(A) the trade name, common name, or generic class or category of any contaminants;

(B) the physical properties of any contaminant including information with respect to its mobility and persistence in soils and ground or surface waters;

(C) the effects of any contaminant of human health, welfare, or the environment;

(D) any monitoring data or analysis of discharges from a source of contaminants; or

(E) any ground water monitoring data.

(6) Notwithstanding any limitation contained in this section or any other provision of law, all information reported to or otherwise obtained by the Administrator under this section shall be made available, upon written request of any duly authorized committee of the Congress, to such committee.

RESEARCH INSTITUTES

SEC. 105. (a) GRANT PROGRAM.—The Administrator shall make grants to institutions of higher learning or other research institutions (or consortia of such institutions) which are nonprofit organizations to establish and operate four ground water research institutes in the United States.

(b) RESPONSIBILITIES OF THE INSTITUTES.—The responsibility of each ground water research institute established under this section shall include, but not be limited to, the conduct of research and training relating to the protection, maintenance, and restoration of ground water resources and the publication and dissemination of the results of such research.

(c) APPLICATIONS.—Any institution of higher learning or other research institution (or consortium of such institutions) which is a nonprofit organization and which is interested in receiving a grant under this section shall submit to the Administrator an application in such form and containing such information as the Administrator may require by regulation.

(d) SELECTION CRITERIA.—The Administrator shall select recipients of grants under this section on the basis of the following criteria—

(1) each research institute shall be located in a State or region of a State which makes significant use of ground water to meet drinking water, agricultural or other needs and is representative of a given region of the Nation;

(2) each research institute shall, to the extent practicable, be located in an area which has experienced significant ground water contamination or depletion problems;

(3) each research institute shall have available for carrying out this section demonstrated research capability;

(4) each research institute shall have the capability to provide leadership in making national and regional contributions to the solution of both long-range and immediate ground water contamination or depletion problems;

(5) each research institute shall make a commitment to support ongoing ground water research programs with budgeted institutional funds; and

(6) each research institute shall have an interdisciplinary staff with demonstrated expertise in ground water management and research.

(e) FEDERAL SHARE.—The Federal share of a grant under this section shall not exceed 75 per centum of the costs of establishing and operating each ground water research institute and related activities carried out by the grant recipients.

(f) LIMITATION ON USE OF FUNDS.—No funds made available to carry out this section shall be used for the acquisition of real property (including buildings) or the construction or substantial modification of any building.

(g) EQUITABLE DISTRIBUTION.—The Administrator shall allocate funds made available to carry out this section equitably among the regions of the United States. One of the four institutes shall be the National Center for Ground Water Research, a consortium between Oklahoma University, Oklahoma State University and Rice University. One of the four institutes shall serve an area of primarily karstic topography. One of the four institutes shall serve an area of primarily intermountain glaciated geology.

(h) TECHNOLOGY TRANSFER.—Not less than 20 per centum of the funds made available to carry out this section for any fiscal year shall be available to carry out technology transfer activities.

(i) PROPOSED RESEARCH PROGRAM.—Prior to and as a condition of receipt each year of funds appropriated to carry out this section, each research institute shall submit to the Administrator for approval a ground water research program that includes assurances, satisfactory to the Administrator, that such program was developed in consultation with the States, local governmental entities, and other agencies and institutions within the region having ground water protection or management responsibilities and interested members of the public. Such program shall include plans to promote research, training, information dissemination, and other activities meeting the needs of the region and the Nation, and shall encourage regional cooperation among institutions in research into areas of ground water protection, maintenance, and restoration that have a regional or national character. The ground water research committee established pursuant to section 102 of this Act shall review proposed research programs and advise the Administrator concerning approval of proposed programs.

(j) REVIEW AND EVALUATION.—

(1) The Administrator shall establish procedures for a careful and detailed evaluation of each research institute to determine whether the quality and relevance of its ground water resources research and its effectiveness as an institution for planning, conducting and arranging for research warrants its continued support under this section in the national interest. The evaluation of each research institute shall be made by a team of knowledgeable individuals including research personnel of the Environmental Protection Agency, other agencies of the United States including the Geological Survey, university faculty or administrators, personnel from State and local governmental entities with ground water management or protection responsibilities, and private citizens selected for this purpose.

The Administrator may also secure the cooperation of the National Research Council and the National Academy of Sciences for the purpose of this evaluation. The evaluation team shall visit each research institute and shall assess the scientific quality of its research program, the potential effectiveness of its research in meeting ground water protection and management needs, and the demonstrated performance in making research results available to users in the region and elsewhere in the Nation. Criteria for making the determination that a research institute is an effective instrument for ground water resources research shall include the following: accreditation in sufficient disciplines to successfully mount a multidisciplinary research program; sufficient resources, including laboratory, library, computer and support facilities; a sufficiently close proximity to a university to provide an effective working relationship with other researchers, faculty and students in a wide range of disciplines; and an institutional commitment to the support and continuation of an effective ground water resources research and education program.

(2) The Administrator shall arrange for each of the research institutes supported under this section to be evaluated within two years after its establishment

and to be reevaluated at intervals not to exceed five years. If, as a result of any such evaluation, the Administrator determines that a research institute does not qualify for further support under this section, then no further grants to the research institute may be made until the research institute's qualification is reestablished to the satisfaction of the Administrator.

ASSESSMENTS OF SOURCES OF CONTAMINANTS

SEC. 106. (a) GENERAL AUTHORITY.—The Administrator, in consultation with the ground water research committee established by section 102, the Director of the Geological Survey, the heads of other appropriate Federal agencies and officials of the several States shall conduct a series of nationwide ground water quality assessments to identify the frequency and concentration of contaminants in ground water associated with various categories and subcategories of sources or potential sources of contaminants. The assessments authorized by this section shall include monitoring at wells which supply public water systems and at wells which supply private households to determine effects or potential effects of such sources on public health and at other ground water sampling points to determine effects of such sources on the general quality of the Nation's ground water resources.

(b) CATEGORIES AND SUBCATEGORIES; SCHEDULE.—The assessments conducted pursuant to the authority of subsection (a) shall include, but need not be limited to, assessments with respect to the categories and subcategories of sources or potential sources of contaminants listed in paragraphs (1) through (7). Each assessment shall be completed and a report of the assessment transmitted to the President and to the Congress not later than the date indicated in the following schedule for each category or subcategory—

(1) pesticide applications, January 1, 1990;

(2) septic tanks and cesspools, January 1, 1991;

(3) landfills, surface impoundments and wastepiles, July 1, 1991;

(4) class V injection wells including agricultural drainage wells, January 1, 1992;

(5) fertilizer applications, January 1, 1992;

(6) irrigation return flows, July 1, 1992; and

(7) publicly owned treatment works, July 1, 1992.

(c) OTHER CATEGORIES.—The Governor of any State may petition the Administrator to initiate a nationwide assessment of a category or subcategory of sources in addition to those listed in subsection (b). The Administrator shall respond to the petition within ninety days and shall include a copy of the petition and any response in the annual plan required by subsection (j).

(d) PRELIMINARY PHASES.—In conducting the assessments authorized by subsection (a) the Administrator is directed to complete the following preliminary phases for each assessment:

(1) in cooperation with the several States, the Administrator shall conduct a survey to determine the number, type, and geographic distribution of sources in each category or subcategory;

(2) in cooperation with the directors of the national laboratories, the Administrator shall develop the analytical techniques necessary to test for the full range of contaminants which may be associated with any category or subcategory of sources;

(3) the Administrator, acting through the Office of Drinking Water, shall prepare health advisories for each of the contaminants which are likely to be associated with any particular category or subcategory of sources;

(4) the Administrator shall publish the design of each assessment, including sampling and analytical protocols, and shall take comment, including comment from the Science Advisory Board, on the elements of the assessment; and

(5) the Administrator shall conduct a pilot study for each assessment the results of which shall be reviewed by the Science Advisory Board before the full assessment is begun.

(e) SCOPE OF THE ASSESSMENTS.—The ground water quality assessments conducted pursuant to this section shall be adequate to—

(1) characterize, with a high degree of statistical confidence, the impact of the category or subcategory of sources on the quality of drinking water reaching wells which supply public water systems and wells which supply private households;

(2) characterize, with a high degree of statistical confidence, the impact of the category or subcategory of sources on the quality of the Nation's ground water generally;

(3) determine the interaction between various characteristics of the saturated and unsaturated zone related to ground water vulnerability and the likelihood that particular source within the category or subcategory will have adverse effects on ground water quality; and

(4) determine the effectiveness of various control strategies and technologies that are practiced or employed in association with particular sources in the category or subcategory to reduce or prevent ground water contamination.

(f) NOTIFICATION, CONFIDENTIALITY AND CORRECTIVE ACTION.—

(1) Public water system.—To the extent that a contaminant (or contaminants) is found in any well supplying a public water system as the result of an assessment authorized by this section, the Administrator shall notify the public water system of the presence of such contaminant and the public water system shall in response take all steps required by the Safe Drinking Water Act (42 U.S.C. 300f, et seq.) including notification of the persons served by such system as provided in sections 1414(c) and 1445(a) of such Act.

(2) Private household wells.—To the extent that contaminants are found in any well supplying a private household as the result of an assessment authorized by this section, the Administrator shall notify the owner of the well (and any other person residing on the property who depends on the well for a potable water supply) and include with the notification a copy of the health advisory (or advisories) for the contaminant (or contaminants) detected and shall provide counseling to the owner of the well on the appropriate steps to take in response to the contamination, but shall otherwise keep confidential all information as to the quality of the water in the well or any other information acquired as a part of the assessment.

(3) REFERRAL FOR CORRECTIVE ACTION.—To the extent a contaminant (or contaminants) is found at any drinking water well or ground water sampling point as the result of an assessment authorized by this section and it is possible to identify a particular source of the contaminant (or contaminants), the Administrator shall notify appropriate officials of the local, State, or Federal government for response, including action to abate or correct the contamination as provided in other law.

(g) COOPERATION WITH THE STATES.—In conducting the assessments authorized by this section, the Administrator shall to the maximum extent possible, involve appropriate officals of the States in each phase of the assessment including: survey of existing sources; conduct of the pilot study; selection of the wells to be sampled; interviews and sampling done as part of the assessment; notification of owners of wells where contaminants are found; and actions taken to abate or correct sources of contamination.

(h) ROLE OF THE SCIENCE ADVISORY BOARD.—In seeking and incorporating the views of the Science Advisory Board in the conduct of the assessments authorized by this section, the Administrator shall provide members of the Board (or the appropriate subcommittee) with all necessary materials in a timely fashion so as to assure prompt completion of each assessment. In no event shall the report required by subsection (k) be delayed by the process of consultation with the Science Advisory Board, but such report shall include comments from the Board to the extent that the Board is not in full accord with the findings as reported.

(i) PUBLIC PARTICIPATION.—To the maximum extent possible (consistent with the need for confidentiality of the results as provided in subsection (e)(2)), the Administrator shall involve the public in the design and conduct of the assessments authorized by this section including the appointment of an advisory committee for the purpose of providing the Administrator with technical assistance in the design and conduct of each assessment and notice and opportunity for public comment on each report before it is submitted.

(j) IMPLEMENTATION PLAN.—The Administrator shall provide to Congress within two years of enactment of this Act and annually thereafter, a plan for implementing this section including a report on the status of each assessment required by subsection (b) and any plans to initiate assessments for categories or subcategories not listed in that subsection.

(k) REPORT.—The Administrator shall prepare a report on the findings of each assessment together with any recommendations for regulatory or legislative modifications which the Administrator determines to be appropriate in light of such findings. The Administrator shall complete draft reports for each assessment not later than ninety days before the schedule of completion dates listed in subsection (b). The draft reports shall then be made available for public comment for a period of at least forty-five days. The final report shall be submitted to the President and to the Committee on Energy and Commerce of the House of Representatives and to the Committee on Environment and Public Works of the Senate, to the several States and to the public.

ADDITIONAL PROVISIONS

SEC. 107. (a) AUTHORITIES OF THE ADMINISTRATOR.—Nothing in this Act shall be interpreted, construed or applied to limit or diminish the authorities granted to the Administrator under any other statute or Executive order or to preclude the collection of information or the conduct of any research, development or demonstration activities for other purposes including for the development of regulatory or remediation measures.

(b) PEER REVIEW.—All studies and results of studies conducted under this Act shall be reported or adopted only after appropriate peer reveiw. Such peer review shall be completed, to the extent practicable within sixty days, and shall be conducted by panels of no less than three and no more than seven members, who shall be disinterested scientific experts selected for such purposes by the Administrator in consultation with the National Science Foundation on the basis of their reputation for scientific objectivity and the lack of institutional ties with any person involved in the conduct of the study or research under review. Not later than twelve months after the date of enactment of this Act, the Administrator shall issue guidelines for the implementation of this subsection including criteria to be used in determining which persons qualify as "disinterested" scientific experts.

(c) FURNISHING OF TEST FACILITIES AND EQUIPMENT.—

(1) A contract or cooperative agreement of the Agency for research, development or demonstration, may provide for the acquisition or construction by, or furnishing to, the contractor, of research, developmental, demonstration, or test facilities and equipment that the Administrator determines to be necessary for the performance of the contract or cooperative agreement. The facilities and equipment may be acquired or constructed at the expense of the United States, and may be lent or leased to the contractor with or without reimbursement, or may be sold to the contractor at fair value. This subsection does not authorize new construction or improvements having general utility.

(2) Facilities or equipment that would not be readily removable or separable without unreasonable expense or unreasonable loss of value may not be installed or constructed under this section on property

not owned by the United States, unless the contract or cooperative agreement contains—

(A) a provision for reimbursing the United States for the fair value of the facilities at the completion or termination of the contract or within a reasonable time thereafter;

(B) an option in the United States to acquire the underlying land; or

(C) an alternative provision that the Administrator considers to be adequate to protect the interests of the United States in the facilities or equipment.

(3) Proceeds of sales or reimbursements under this subsection shall be paid into the Treasury as miscellaneous receipts, except to the extent otherwise authorized by law with respect to property acquired by the contractor.

TITLE II—PROGRAMS OF THE GEOLOGICAL SURVEY

AMENDMENTS TO THE ORGANIC ACT

SEC. 201. The Act of March 3, 1879 (20 Stat. 394) establishing the Geological Survey is amended by inserting after subsection (a) of section (1) (43 U.S.C. 31(a)), the following new subsection and renumbering the subsequent subsections accordingly—

"(b) WATER RESOURCES RESEARCH.—The Secretary of the Interior acting through the Geological Survey is authorized to undertake research, investigations, appraisals, surveys, and related activities with respect to the Nation's water resources. The Secretary is authorized to undertake such activities in cooperation with other Federal, State, and local governments and agencies, private organizations, academic institutions and individuals. The Secretary is further authorized to disseminate the results of such research, investigations, appraisals, surveys and related activities.

"(c)(1) REIMBURSEABLE ACTIVITIES.—The Secretary may undertake the activities authorized by subsection (b) of this section on a reimburseable or cooperative basis with other Federal agencies, State and local governments, and Federal permittees or licensees but only after execution of a written agreement which outlines for whom such reimburseable or cooperative activities are being undertaken, and the purpose, cost and duration of the activities.

"(2) FEDERAL-STATE COOPERATIVE PROGRAM.—The activities authorized by subsection (b) of this section shall include, but are not limited to, a Federal-State cooperative program to determine the quantity and quality of surface water and ground water of the United States and the uses of the Nation's water resources through a series of projects jointly funded on an equal matching basis by the Geological Survey and the States or their political subdivisions and interstate compacts. In the case of projects designed to identify and delineate the locations of ground water and to determine the quantity and quality of such resources, the Secretary shall provide funding equal to 60 per centum of the costs of such project.

"(3) REGIONAL AQUIFER SYSTEMS ANALYSIS.—The activities authorized by subsection (b) of this section shall include, but are not limited to, a program to investigate ground water quality and flow characteristics and delineate ground water locations in various hydrologic regions of the United States to—

"(A) determine the availability and chemical quality of water stored in each aquifer system;

"(B) determine the discharge and recharge characteristics of each aquifer system;

"(C) determine the hydrogeologic and chemical controls that govern the response of each aquifer system to stress;

"(D) develop models to improve understanding of the affects of human activities on each system; and

"(E) develop maps at a consistent scale to be determined by the Secretary delineating aquifer systems and the recharge areas of such systems.

"(4) TOXICS HYDROLOGY PROGRAM.—The activities authorized by subsection (b) of this section shall include, but are not limited to, a program to improve understanding of the processes which control the movement, fate, and alteration of toxic and hazardous substances and other contaminants in ground water.

NATIONAL GROUND WATER QUALITY INVENTORY

SEC. 202. (a) REPORT.—

(1) IN GENERAL.—The Secretary of the Interior, acting through the Geological Survey and in consultation with the Environmental Protection Agency, other Federal agencies, and the several States, shall prepare a report which shall include, but need not be limited to, the following—

(A) an assessment of the Nation's ground water quantity and quality based on existing and readily available data and information, including a description of areas where insufficient quantity and quality information is available;

(B) an evaluation of the adequacy of existing ground water data collection and monitoring programs conducted by Federal, State, and local governments and private industry including an assessment of monitoring protocols and recommendations for improvement to such protocols; and

(C) a description of projected changes and trends in the quantity and quality of the Nation's ground water resources to the extent that existing data and information are available.

(2) REPORTING DATE.—The Secretary shall complete a draft of the report authorized by paragraph (1) no later than one hundred and eighty days after the date of enactment of this Act. Such report shall then be made available for public comment for a period of at least forty five days. The final report shall be submitted to the House Committee on Interior and Insular Affairs and the Senate Committee on Environment and Public Works, the several States, and to the public no later than 12 months after the date of enactment of this Act.

(b) PROGRAM.—

(1) ESTABLISHMENT OF PROGRAM.—The Secretary of the Interior, acting through the Geological Survey, is authorized and directed, based on information contained in the report prepared pursuant to subsection (a) of this section and after consultation with the Environmental Protection Agency, other Federal agencies, and the several States, to establish and conduct a national ground water quantity and quality assessment program to—

(A) identify, assess, and monitor the quantity and quality of the Nation's ground water resources; and

(B) project changes and trends in the quantity and quality of the Nation's ground water.

To the extent practicable, the Secretary shall conduct such program using data collected pursuant to section 201(c) of the Ground Water Research Act of 1987 and any additional data developed by other Federal agencies, the State, or other persons.

(2) ELEMENTS OF THE PROGRAM.—In conducting the program authorized by paragraph (1) of this subsection, the Secretary shall ensure that the program—

(A) includes agreements or memorandum of understanding, where appropriate, with the Environmental Protection Agency, other Federal agencies, the several States, local governments, private organizations and individuals detailing the ground water monitoring and assessment responsibilities of each entity in order to assure consistency and avoid duplication of effort;

(B) recommends and seeks to achieve, to the extent possible considering other statutory mandates, uniform data collection protocols for Federal agencies, State and local governments, and private organizations and individuals to use in the collection of reliable ground water data and information;

(C) provides guidance on the use of existing ground water quantity and quality data and information including means to integrate and analyze data collected under varying protocols and various monitoring and assessment programs;

(D) assists Federal agencies in meeting their responsibilities under this Act and the Safe Drinking Water Act (42 U.S.C. 300f, et seq.), the Federal Water Pollution Control Act (33 U.S.C. 1151, et seq.), the Solid Waste Disposal Act (42 U.S.C. 6901, et seq.), the Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 135, et seq.), the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. 9601, et seq.), the Toxic Substances Control Act (15 U.S.C. 2601, et seq.), the Hazardous Liquid Pipeline Safety Act (49 U.S.C. App 2001, et seq.), the Surface Mining Control and Reclamation Act (49 U.S.C. 1201, et seq.), the Federal Land Policy and Management Act (43 U.S.C. 1701, et seq.), the Uranium Mill Tailings Radiation Control Act (42 U.S.C. 7901, et seq.), and other Federal statutes with respect to the protection and management of ground water resources;

(E) improves the generic knowledge and understanding of the nature, extent, causes and effects of ground water contamination;

(F) assists State and local governments in the protection and management of ground water resources and the design of ground water monitoring programs; and

(G) is specifically designed to obtain complementary surface water quality data to provide an integrated knowledge of water quality conditions within specific hydrologic regions and subregions.

For this purpose the Secretary is authorized to obtain any water quality information required or permitted to be obtained by law and in the possession of such Federal agencies, States, or political subdivisions thereof.

(3) Report.—The Secretary shall report biennially to the Congress on the results of the assessment program established by this subsection.

(4) Public participation.—The Secretary shall assure, to the maximum extent practicable, that the design and conduct of the program authorized by this section provides for public participation, including

notification and opportunity for public comment on any recommendations or reports to the Congress which may result from the program.

WATER RESOURCES RESEARCH AMENDMENTS

SEC. 203. Section 108 of the Water Resources Research Act of 1984 (Public Law 98-242) is amended—

(a) in paragraph (6) by inserting ", contamination" after "Depletion"; and

(b) in paragraph (8) by inserting "quality and quantity" after "water".

AUTHORITIES OF THE ADMINISTRATOR

SEC. 204. Nothing in this title shall be construed, interpreted or applied to limit or diminish in any way the authority or responsibility of the Adminstrator of the Environmental Protection Agency to conduct monitoring of the quality or quantity of the Nation's ground or surface water resources or any other activity which is necessary or appropriate to carry out the duties assigned to the Administrator and the Agency by this Act or other Federal statutes.

TITLE III—PROGRAMS OF OTHER FEDERAL AGENCIES

AGRICULTURAL RESEARCH SERVICE

SEC. 301. (a) PURPOSE.—It is the purpose of this section to authorize research, development and demonstration of methods, practices and techniques which will provide ground water of acceptable quality for irrigation, livestock watering and other agricultural uses and which will assure that agricultural impacts on ground water quality are minimized to the maximum extent possible. In the conduct of such research, development and demonstration, the Secretary of Agriculture shall give highest priority to projects and activities which improve the efficiencies of agricultural chemicals including nutrients and poisons in use; reduce water requirements for irrigation; demonstrate integrated pest management techniques; reduce the number of agricultural chemicals in use through the demonstration of effective alternatives; and improve chemical disposal practices.

(b) GENERAL AUTHORITY.—The Secretary of Agriculture acting through the Agricultural Research Service, and in consultation and cooperation with the Secretary of the Interior, the Administrator of the Environmental Protection Agency and the heads of other appropriate agencies of the United States, shall establish a national research, development and demonstration program with respect to the impact of agricultural practices on ground water quality. For purposes of this section agricultural practices shall include, but not be limited to, the application of pesticides and nutrients, irrigation practices and the operation of animal feedlots. In carrying out such program the Secretary may—

(1) conduct, and promote the coordination and acceleration of research, investigations, experiments,

demonstrations, surveys and studies relating to the causes, effects, extent, prevention, detection, and correction of ground water contamination which results, or may result, from agricultural practices, including storage, preparation, application and disposal practices (including back-siphoning and the rinsing and disposal of containers);

(2) encourage, cooperate with, and render technical assistance to the States and to local governmental entities, other appropriate public agencies and authorities, nonprofit institutions and organizations, and other persons in the conduct of such activities;

(3) establish technical advisory committees and interagency working groups composed of recognized experts in various aspects of ground water protection and the agricultural sciences to assist in the examination and evaluation of research progress and proposals and to avoid duplication of research;

(4) exercise in the same manner and to the same extent those authorities granted to the Administrator in paragraphs (1), (2), (3), (5), (7), (8), (9), (10), (13) and (14) of section 101(a) of this Act.

(c) AREAS OF INVESTIGATION.—The Secretary shall conduct or assist research, investigations, studies, surveys, or demonstrations with respect to (but not limited to) the following—

(1) chemical and biological interactions and processes including—

(A) the fate and transport of organic and inorganic substances released by agricultural practices from the point of release through the soil, vadose and saturated zones (and including releases and transport through air and surface waters),

(B) the biological, chemical and physical factors that govern nutrient transformation and mediate pesticide efficacy, stability, fate and transport in the soil, vadose and saturated zones,

(C) the source, extent and occurrence of agricultural chemicals and their metabolites and degradation products including pesticides, nutrients and salts resulting from irrigation in the soil, vadose and saturated zones;

(2) analytical models and testing methodology including—

(A) physical process models to describe the movement of water and agricultural chemicals through the soil, vadose and saturated zones,

(B) methods of measuring, sampling and characterizing the spatial and temporal variability, flux rate, and other features of the physical environment in the soil, vadose and saturated zones,

(C) predictive models to manage the impact of alternative agricultural chemical applications, water management programs, and production systems on ground or surface water quality,

(D) management systems to enable users to determine optimal nutrient and pesticide applications while minimizing effects on ground water quality for various soils, geomorphology and cultural conditions, and

(E) data bases and data base management systems for model testing and validation; and

(3) management and control including—

(A) the effects of changing application technology, irrigation and agricultural production systems on chemical and water flux in the soil, vadose and saturated zones,

(B) the effectiveness of water management and tillage practices in controlling the movement of water and its constituents through the interacting soil medium,

(C) the effect of various water management and agricultural production systems on soil microbiota which may effect the efficacy, persistence and breakdown of agricultural chemicals, and

(D) new agricultural chemical products including controlled release pesticides and nutrients which may improve the efficacy, reduce application variability, and minimize the possibility of soil and ground water contamination.

TITLE IV—GENERAL PROVISIONS

SPECIAL STUDIES

SEC. 401. (a) EFFICIENT USE OF NUTRIENTS.—

(1) IN GENERAL.—The Secretary of Agriculture, in cooperation with the Administrator and the Director of the National Fertilizer Development Center, shall conduct research and investigations on practices, methods and techniques for improving the efficiency of fertilizer uses in agriculture including practices which would change the timing, rate or methods of fertilizer application to reduce the potential for nitrates and other fertilizer constituents or degradation products to leach to ground water.

(2) REPORT.—The Secretary of Agriculture shall report the preliminary results of such research and investigations to the Congress within twenty-four months

after the date of enactment of this Act. Such report shall include recommendations as to the policies and programs that may be implemented by Federal agencies or the States to encourage the use of practices that are more efficient. The report shall also include an estimate of the benefits to be derived from the adoption of such practices, methods and techniques and an estimate of any increase in costs associated with such practices, methods and techniques.

(3) AUTHORIZATION.—There are authorized to be appropriated for purposes of carrying out this subsection not to exceed $3,500,000 in each of the fiscal years ending September 30, 1988 and 1989.

(b) CHEMICAL CONSTITUENTS OF COMMERCIAL FERTILIZERS.—

(1) IN GENERAL.—The Administrator, after consultation with the Secretary of the Department of Agriculture and the Director of the National Fertilizer Development Center, shall conduct a study of commercial fertilizer products sold for use in the United States to determine the chemical constituents including the presence of trace elements in such products and the potential for such constituents to leach to and contaminate ground water resources. The study shall include a survey of fertilizer products used in agriculture and

sold in commerce for use on lawns, gardens and golf courses.

(2) REPORT.—The Administrator shall report to the Congress the results of the study not later than eighteen months after the date of enactment of this Act including any steps which the Administrator will take or will recommend to other Federal agencies to protect human health or the environment from any adverse effect which may result from the use of such products.

(3) AUTHORIZATION.—There are authorized to be appropriated without fiscal year limitation $1,000,000 to carry out the study and issue the report required by this subsection.

(4) REGULATORY ACTION.—The Administrator shall take such actions as are necessary and appropriate pursuant to the authorities granted the Administrator in the Toxic Substances Control Act (15 U.S.C. 2601, et seq.) to prevent any adverse effect on the human health or the environment which may result from the presence of hazardous constitutents in fertilizer products distributed in commerce within the United States.

(c) HEALTH EFFECTS OF NITRATES AND NITROSAMINES.—

(1) IN GENERAL.—The Administrator shall conduct a study of the effects on public health (including carcinogenic endpoints) of nitrates, nitrosamines and other metabolites of nutrients and nitrogen compounds in public and private drinking water supplies, the sources of such contaminants, current and projected levels of exposure to such contaminants under various conditions, technologies or measures to reduce exposure including modification in agricultural and domestic practices and treatment techniques for water supplies (including private water supplies), and the costs of such technologies, measures or treatment techniques. Such report shall include an evaluation of current standards for such contaminants promulgated pursuant to the Safe Drinking Water Act and whether additional steps are necessary to protect public health (including the health or persons relying on private water supplies) from exposure to such contaminants.

(2) COORDINATION.—In furtherance of this study, the Administrator may review studies and research conducted by other Federal agencies and State agencies with respect to such contaminants and may invite participation by other concerned persons including other Federal agencies, State and local governments and nonprofit institutions in the conduct of the study.

(3) REPORT.—The Administrator shall publish a report on such study not later than eighteen months after the date of enactment of this Act, unless a longer period is necessary to conduct laboratory research, in which case, a preliminary report shall be published on such date and the final report shall be published no later than forty-eight months after the date of enactment of this Act.

(4) AUTHORIZATION.—There are authorized to be appropriated to carry out the purposes of this subsection not to exceed $2,000,000 without fiscal year limitation.

(d) LEAK DETECTION SYSTEMS FOR UNDERGROUND TANKS.—

(1) IN GENERAL.—The Administrator shall conduct such research and other activities as are necessary to develop and demonstrate a leak detection system or systems for underground storage tanks containing petroleum that is cost effective to detect releases of petroleum products from such tanks below levels which would have any adverse effect on human health or the environment. Such detection system or systems shall be the best available technology for use by the owners and operators of underground storage tanks at service stations and other small businesses, heating oil and

motor fuel tanks used on residential or farm properties, and large petroleum supply systems used by industry and public institutions (including airports) for heating and other energy needs. For purposes of this subsection "levels which would have any adverse effect on human health or the environment" includes standards for petroleum products or the constituents of petroleum products or their degradation products promulgated pursuant to the Safe Drinking Water Act (42 U.S.C. 300f, et seq.), the Federal Water Pollution Control Act (33 U.S.C. 1151, et seq.), the Solid Waste Disposal Act (42 U.S.C. 6901, et seq.), the Toxic Substances Control Act (15 U.S.C. 2601, et seq.), and the Clean Air Act (42 U.S.C. 7401, et seq.).

(2) REPORT AND DISSEMINATION.—The Administrator shall report to the Congress not later than twenty-four months after the date of enactment of this Act on the results of the development and demonstration activities authorized by this section. Any leak detection system which is cost effective and protective of human health and the environment which is developed and demonstrated as a result of these authorities shall be made available to the public through an aggressive program of technology transfer conducted by Administrator or by contract.

(3) AUTHORIZATION.—To carry out the purposes of this subsection there are authorized to be appropriated $5,000,000 without fiscal year limitation.

(e) GEOTHERMAL HEAT PUMPS.—

(1) IN GENERAL.—The Director of the Geological Survey is authorized and directed to conduct a study of the existing and projected use of geothermal wells including wells used in the heating of residential and commercial buildings and the impacts of such wells on the availability and quality of ground water resources in various localities.

(2) REPORT.—The Director shall make the results of such study available to State and local governments where the use of geothermal wells for residential and commercial heating is a widespread or increasing practice.

(3) AUTHORIZATION.—There are authorized to be appropriated not to exceed $1,500,000 without fiscal year limitation to carry out the purposes of this section.

(f) MICROBIAL TREATMENT OF HAZARDOUS WASTE.—

(1) IN GENERAL.—The Administrator shall conduct such research and other activities as are necessary to develop and demonstrate the use of microbial activi-

ty to neutralize and contain wastes associated with hazardous waste disposal, or mining wastes and other such wastes suitable for biological treatment. The study shall include a survey of microbes suitable to remediate contaminants, and the ecological requirement for the enhanced use of these microbes and the capability of the microbes to remediate hazardous contaminants.

(2) REPORT.—The Administrator shall report to the Congress the results of the study not later than eighteen months after the date of enactment of this subsection including any recommendations as to the policies and programs that may be implemented by Federal agencies or the States to encourage the use of bioremediation in a manner that is protective of human health and the environment.

(3) AUTHORIZATION.—There are authorized to be appropriated without fiscal year limitation $5,000,000 to carry out the study and issue the report required by this subsection.

(g) AGRICULTURAL DRAINAGE WELLS.—

(1) IN GENERAL.—The Administrator, in consultation with the Secretary of the Department of Agriculture, shall conduct a study of agricultural drainage wells including the impact of such wells on ground water

quality, the alternatives to wells for drainage purposes and the costs of plugging or otherwise closing wells.

(2) REPORT.—The Administrator shall report the results of such study to the Congress within twenty-four months after the date of enactment of this Act. Such report shall include an inventory of agricultural drainage wells in each State and a description of Federal or State programs that may be available to assist the owners of such wells with the cost of closure and the installation of alternative practices.

(3) AUTHORIZATION.—There are authorized to be appropriated for purposes of carrying out this subsection not to exceed $750,000 without fiscal year limitation.

(h) CONSERVATION TILLAGE.—

(1) STUDY.—There is authorized to be appropriated to the Agricultural Research Board of the National Research Council such sums as may be necessary to carry out a study of the impact of conservation tillage and other soil and water conservation practices on ground water quality. The study authorized by this subsection shall document agricultural practices, including increased use of agrichemicals, which are associated with conservation tillage and which may have an adverse impact on ground water quality. The study

shall also consider proposed State programs to control nonpoint source pollution which are developed pursuant to section 319 of the Clean Water Act (33 U.S.C. 466, et seq.) to determine the likely effect of such programs on ground water quality.

(2) REPORT.—The National Research Council shall report the results of any study or investigations conducted pursuant to this section to the Congress and shall disseminate such report or reports widely to public officials and to organizations with a responsibility for or interest in the impact of agricultural practices on surface and ground water quality.

NATIONAL GROUND WATER INFORMATION CLEARINGHOUSE

SEC. 402. The Administrator is authorized and directed, after consultation with the Director of the Geological Survey and the heads of other appropriate Federal agencies, to establish a national ground water clearinghouse to be used to disseminate ground water quality information to other Federal agencies, State and local governments, and private organizations and individuals. The clearinghouse shall be a repository for reliable ground water information to be collected from and made available to such government agencies, organizations and individuals. At a minimum the clearinghouse established by this section shall make available reports, programs, and materials developed pursuant to sections 102(b), 103(k), 104(a), 104(b), 104(f), 105(i), 105(j), 202(a), 202(b)(3), 401(a)(2), 401(b)(2), 401(c)(3), 401(d)(2), 401(e)(2), 401(f)(2), 401(g)(2), 401(h)(2), and 403(b) of this Act. Unless the Administrator shall determine otherwise, the National Ground-Water Information Center located in Dublin, Ohio, shall be designated as the national clearinghouse to fulfill the requirements of this section.

COORDINATION

SEC. 403. (a) IN GENERAL.—The President shall provide for the coordination of research, development, and demonstration activities with respect to ground water quality and quantity conducted by agencies of the United States. Such coordination shall include, but need not be limited to—

(1) continuing review of the ground water research, development, and demonstration activities conducted by each agency of the United States to determine the effectiveness of such efforts in fulfilling the purposes of this Act and other statutes authorizing activities to prevent, detect, and correct ground water contamination;

(2) identification and elimination of any duplication or overlap between or among the ground water research, development, and demonstration programs of the various agencies of the United States;

(3) identification of the resources, including appropriations and allocated personnel ceilings, needed by

various Federal agencies and the research institutes authorized by section 105 of this Act to conduct research, development, and demonstration activities with respect to ground water quality and availability;

(4) review of the ground water information and data collected and the reporting or paperwork requirements imposed by various Federal agencies and recommendations to modify the requirements to maximize the value of the information collected for use in all protection and management programs conducted by agencies of the United States and by State and local governments; and

(5) actions, including the establishment of interagency committees and the joint funding of projects, to facilitate interagency communication on ground water research, development, and demonstration programs.

(b) REPORT.—Not later than twenty-four months after the date of enactment of this Act and biennially thereafter, the President shall transmit to the Congress a message setting forth a description of the activities that the President has undertaken to discharge the duties and responsibilities established by this section.

PATENT POLICY

SEC. 404. (a) Whenever any invention is made or conceived in the course of or under contract of the Administrator carrying out this Act and the Administrator determines that—

(1) the person who made the invention was employed or assigned to perform research, development, or demonstration work and the invention is related to the work he or she was employed or assigned to perform, or that it was made during working hours, or with a contribution by the Government or the use of Government facilities, equipment, materials, allocated funds, information proprietary to the Government, or services of Government employees during working hours; or

(2) the person who made the invention was not employed or assigned to perform research, development or demonstration, but the invention is nevertheless related to the contract or to the work or duties he or she was employed or assigned to perform, and was made during working hours, or with a contribution from the Government of the sort referred to in paragraph (1),

title to such invention shall vest in the United States, and if patents on such invention are issued they shall be issued to the United States, unless in particular circumstances the Administrator waives all or any part of the rights of the United States to such invention in conformity with the provisions of this section.

(b) Each contract entered into by the Administrator with any person shall contain effective provisions under which such person shall furnish promptly to the Administrator a written report containing full and complete technical information concerning any invention, discovery, improvement, or innovation which may be made in the course of or under such contract.

(c) Under such regulations in conformity with the provisions of this section as the Administrator shall prescribe, the Administrator may waive all or any part of the rights of the United States under this section with respect to any invention or class of inventions made or which may be made by any person or class of persons in the course of or under any contract of the Administrator, if the Administrator determines that the interests of the United States and the general public will best be served by such waiver. The Administrator shall maintain a publicly available, periodically updated record of waiver determinations. In making such determinations, the Administrator shall have the following objectives—

(1) making the benefits of the ground water research, development and demonstration program widely available to the public in the shortest practicable time;

(2) promoting the commercial utilization of such inventions;

(3) encouraging participation by private persons in the Agency's ground water research, development and demonstration program; and

(4) fostering competition and preventing undue market concentration or the creation or maintenance of other situations inconsistent with the antitrust laws.

(d) In determining whether a waiver to the contractor at the time of contracting will best serve the interests of the United States and the general public, the Administrator shall specifically include as considerations—

(1) the extent to which the participation of the contractor will expedite the attainment of the purposes of the program;

(2) the extent to which a waiver of all or any part of such rights in any or all fields of technology is needed to secure the participation of the particular contractor;

(3) the extent to which the contractor's commercial position may expedite utilization of the research, development and demonstration program results;

(4) the extent to which the Government has contributed to the field of technology to be funded under the contract;

(5) the purpose and nature of the contract, including the intended use of the results developed thereunder;

(6) the extent to which the contractor has made or will make substantial investment of financial resources or technology developed at the contractor's private expense which will directly benefit the work performed under the contract;

(7) the extent to which the field of technology to be funded under the contract has been developed at the contractor's private expense;

(8) the extent to which the Government intends to further develop to the point of commercial utilization the results of the contract effort;

(9) the extent to which the contract objectives are concerned with public health, public safety, or public welfare;

(10) the likely effect of the waiver on competition and market concentration; and

(11) in the case of a nonprofit educational institution, the extent to which such institution has a technology transfer capability and program, approved by the Administrator as being consistent with the applicable policies of this section.

(e) In determining whether a waiver to the contractor or inventor of rights to an identical invention will best serve the interests of the United States and the general public, the Administrator shall specifically include as considerations paragraphs (4) through (11) of subsection (d) as applied to the invention and—

(1) the extent to which such waiver is a reasonable and necessary incentive to call forth private risk capital for the development and commercialization of the invention; and

(2) the extent to which the plans, intentions, and ability of the contractor or inventor will obtain expeditious commercialization of such invention.

(f) Whenever the title to an invention is vested in the United States, there may be reserved to the contractor or inventor—

(1) a revocable or irrevocable nonexclusive, paid-up license for the practice of the invention throughout the world; and

(2) the rights to such invention in any foreign country where the United States has elected not to secure patent rights and the contractor elects to do so, subject to the rights set forth in paragraphs (2), (3), (6), and (7) of subsection (h): *Provided,* That when specifically requested by the Administrator and three

years after issuance of such a patent, the contractor shall submit the report specified in subsection (h)(1) of this section.

(g)(1) Subject to paragraph (2) of this subsection, the Administrator shall determine and promulgate regulations specifying the terms and conditions upon which licenses may be granted in any invention to which title is vested in the United States.

(2) Pursuant to paragraph (1) of this subsection, the Administrator may grant exclusive or partially exclusive licenses in any invention only if, after notice and opportunity for hearing, it is determined that—

(A) the interests of the United States and the general public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to the point of practical or commercial applications;

(B) the desired practical or commercial applications have not been achieved, or are not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(C) exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth risk capital and expenses to bring the invention to the point of practical or commercial applications; and

(D) the proposed terms and scope of the exclusivity are not substantially greater than necessary to provide the incentive for bringing the invention to the point of practical or commercial applications and to permit the licensee to recoup its costs and a reasonable profit thereon:

Provided, That the Administrator shall not grant such exclusive or partially exclusive license if he determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates. The Administrator shall maintain a publicly available, periodically updated record of determinations to grant such licenses.

(h) Each waiver of rights or grant of an exclusive or partially exclusive license shall contain such terms and conditions as the Administrator may determine to be appropriate for the protection of the interests of the United States and the general public, including provisions for the following—

(1) periodic written reports at reasonable intervals, and when specifically requested by the Administrator, on the commercial use that is being made or is intended to be made of the invention;

(2) at least an irrevocable, nonexclusive, paid-up license to make, use, and sell the invention throughout the world by or on behalf of the United States (including any Government agency) and States and domestic municipal governments, unless the Administrator determines that it would not be in the public interest to acquire the license for the States and domestic municipal governments;

(3) the right in the United States to sublicense any foreign government pursuant to any existing or future treaty or agreement if the Administrator determines it would be in the national interest to acquire this right;

(4) the reservation in the United States of the rights to the invention in any country in which the contractor does not file an application for patent within such time as the Administrator shall determine;

(5) the right in the Administrator to require the granting of a nonexclusive, exclusive, or partially exclusive license to a responsible applicant or applicants, upon terms reasonable under the circumstances—

(A) to the extent that the invention is required for public use by governmental regulations,

(B) as may be necessary to fulfill health, safety, or energy needs, or

(C) for such other purposes as may be stipulated in the applicable agreement;

(6) the right in the Administrator to terminate such waiver or license in whole or in part unless the recipient of the waiver or license demonstrates to the satisfaction of the Administrator that the recipient has taken effective steps, or within a reasonable time thereafter is expected to take such steps, necessary to accomplish substantial utilization of the invention; and

(7) the right in the Administrator, commencing three years after the grant of a license and four years after a waiver is effective as to an invention, to require the granting of a nonexclusive or partially exclusive license to a responsible applicant or applicants, upon terms reasonable under the circumstances to terminate the waiver or license in whole or in part, following a hearing upon notice thereof to the public, upon petition by an interested person justifying such hearing—

(A) if the Administrator determines, upon review of such material as the Administrator deems relevant, and after the recipient of the waiver or license, or other interested person, has had the opportunity to provide such relevant and material information as the Administrator may require, that such waiver or license has tended substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology relates, or

(B) unless the recipient of the waiver or license demonstrates to the satisfaction of the Administrator at such hearing that the recipient has taken effective steps, or within a reasonable time thereafter is expected to take such steps, necessary to accomplish substantial utilization of the invention.

(i) The Administrator shall provide an annual periodic notice to the public in the Federal Register, or other appropriate publication, of the right to have a hearing as provided by subsection (h)(7) of this section, and of the availability of records of determinations provided in this section.

(j) The Administrator shall, in granting waivers or licenses, consider the small business status of the applicant.

(k) The Administrator is authorized to take all suitable and necessary steps to protect any invention or discovery to which the United States holds title, and to require that contractors or persons who acquire rights to inventions under this section protect such inventions.

AUTHORIZATIONS

SEC. 404. (a) For the purpose of carrying out the activities authorized by section 101 and 102 of this Act there are authorized to be appropriated $40,000,000 for each of the fiscal years ending September 30, 1988, 1989, 1990, 1991 and 1992.

(b) For the purpose of carrying out the activities authorized by section 103 of this Act there are authorized to be appropriated $25,000,000 for each of the fiscal years ending September 30, 1988, 1989, 1990, 1991 and 1992.

(c) For the purpose of carrying out the activities authorized by section 104 of this Act there are authorized to be appropriated $25,000,000 for each of the fiscal years ending September 30, 1988, 1989, 1990, 1991 and 1992.

(d) For the purpose of carrying out the activities authorized by section 105 of this Act there are authorized to be appropriated $11,000,000 for each of the fiscal years ending September 30, 1988, 1989, 1990, 1991 and 1992.

(e) For the purpose of carrying out the activities authorized by section 106 of this Act there are authorized to be appropriated $10,000,000 for each of the fiscal years ending September 30, 1988, 1989, 1990, 1991 and 1992.

(f) For the purpose of carrying out the activities authorized by section 201 of this Act there are authorized to be appropriated $155,000,000 for each of the fiscal years 1988, 1989 and 1990.

(g) For the purpose of carrying out the activities authorized by section 202 of this Act there are authorized to be appropriated $10,000,000 for each of the fiscal years 1988 and 1989 and $8,000,000 for fiscal year 1990.

(h) For the purpose of carrying out the activities authorized by section 301 of this Act there are authorized to be appropriated $6,000,000 for each of the fiscal years ending September 30, 1988, 1989, 1990, 1991 and 1992.

(i) For the purpose of carrying out the activities authorized by section 402 of this Act there are authorized to be appropriated $5,000,000 for fiscal year 1988 and $3,000,000 for each of the fiscal years 1989, 1990, 1991 and 1992.

(j) For the purpose of carrying out the activities authorized by section 403 of this Act there are authorized to be appropriated such sums as may be necessary.

100TH CONGRESS
1ST SESSION

H. R. 791

IN THE SENATE OF THE UNITED STATES

DECEMBER 4 (legislative day, DECEMBER 3), 1987

Received; read twice and referred to the Committee on Environment and Public Works

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AN ACT

To authorize the water resources research activities of the United States Geological Survey, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE I—WATER RESOURCES AUTHORITY OF THE GEOLOGICAL SURVEY

SEC. 101. SHORT TITLE.

This title may be cited as the "Geological Survey Water Resources Organic Act".

SEC. 102. WATER RESOURCES AUTHORITY.

(a) IN GENERAL.—The Secretary of the Interior (hereinafter in this title referred to as the "Secretary"), acting through the Geological Survey, is authorized to undertake research, investigations, appraisals, surveys, and related activities, of the Nation's water resources. The Secretary is authorized to undertake such activities in cooperation with other Federal, State, and local governments and agencies, and academic institutions. The Secretary is further authorized to disseminate the results of such research, investigations, appraisals, surveys, and related activities.

(b) REIMBURSEMENT.—The Secretary may undertake the activities described in subsection (a) with other Federal agencies or Federal permittees or licensees on a reimbursable basis, but only after execution of an agreement which outlines for whom such activities are being undertaken and the purpose, cost, and duration of the activities. The Secretary shall transmit on a yearly basis a summary of the agreements executed to the Committees on Appropriations and Interior and Insular Affairs of the House of Representatives and the Committees on Appropriations and Energy and Natural Resources of the Senate.

SEC. 103. AUTHORIZATION OF APPROPRIATIONS.

For the purpose of carrying out the water resource activities of the Secretary authorized by this Act, there is authorized to be appropriated $155,000,000 for fiscal year 1988, $158,000,000 for fiscal year 1989, and $160,000,000 for fiscal year 1990.

TITLE II—GROUND WATER RESEARCH

SEC. 201. SHORT TITLE.

This title may be cited as the "National Ground Water Research Act of 1987".

SEC. 202. FINDINGS.

The Congress finds the following:

(1) Ground water is a resource of immeasurable value, comprising 86 percent of the fresh water available for use in the United States.

(2) Ground water supplies approximately one-half of the Nation's population with drinking water and over one-half of the Nation's irrigation water.

(3) Ground water contamination has occurred in every State in the Nation and is being detected with increasing frequency.

(4) Sources of ground water contamination are diverse.

(5) Certain ground water contaminants are associated with adverse health, environmental, economic, and social impacts.

(6) Ground water and surface water are interconnected as related parts of the hydrologic cycle.

(7) While the Federal Government has certain responsibilities for the protection, maintenance, and re-

mediation of ground water quality under existing laws, the primary responsibility for ground water protection, maintenance, and remediation is with States and local governments.

(8) Many States already have comprehensive ground water protection and management programs or are developing such programs.

(9) Although considerable scientific progress has been made in knowledge about ground water resources and ground water contamination, including the transport, transformation, and fate of ground water contaminants and the effects of ground water contamination on human health and the environment, there remain significant gaps in developing and making available needed scientific knowledge.

(10) Presently available technologies to detect, monitor, and mitigate ground water contamination are expensive and highly limited in utility.

(11) Shortages exist in skilled personnel trained in scientific disciplines relevant to the detection, assessment, prevention, and remediation of contaminated ground water resources.

(12) The scientific uncertainties, lack of adequate technologies, and shortage of skilled scientific personnel hinder the ability of Federal agencies or State and

local governments to develop and implement effective ground water management, protection, and remediation policies.

(13) The Nation's ground water quality data collection, analysis, and information dissemination programs and activities are insufficient.

(14) Access to information regarding national ground water quality conditions and trends is essential to improving management of the Nation's ground water resources.

(15) Federal research and development, technical assistance, and financial assistance should be available to support State ground water programs.

(16) Additional Federal research efforts in ground water are necessary to provide the States with adequate technical information and guidance upon which they can develop and implement comprehensive ground water management programs. One of the aims of these research efforts should be to develop risk assessment analyses that States can use to develop ground water standards, where appropriate.

(17) Current Federal programs of research and development with respect to ground water require improved coordination.

(18) The Federal Government lacks a clear and comprehensive statutory mandate to conduct ground water research.

(19) Ground water contamination should be prevented rather than relying on expensive clean up efforts.

(20) Greater efforts are necessary to prevent ground water contamination today and to preserve this valuable resource for current and future generations of Americans.

SEC. 203. DEFINITIONS.

As used in this title—

(1) ADMINISTRATOR.—The term "Administrator" means the Administrator of the Environmental Protection Agency.

(2) AGENCY.—The term "Agency" means the Environmental Protection Agency.

(3) ASSESSMENT.—The term "assessment", when used with respect to ground water or ground water resources, means a description of the location, hydrogeological properties, quantity, quality, and rates of depletion of such resources.

(4) FEDERAL AGENCY.—The term "Federal agency" means any department, agency, or other in-

strumentality of the Federal Government, including any Government corporation.

(5) LOCAL GOVERNMENT.—The term "local government" means any city, town, borough, county, parish, district, or other public body which is a political subdivision of a State and which is created pursuant to State law.

(6) NONPROFIT ORGANIZATION.—The term "nonprofit organization" means any organization, association, or institution described in section 501(c)(3) of the Internal Revenue Code of 1986 which is exempt from taxation pursuant to the provisions of section 501(a) of such Code.

(7) PERSON.—The term "person" means an individual, trust, firm, joint stock company, corporation (including government corporation), partnership, association, consortium, joint venture, State, local government, commission, regional agency, interstate agency, or Federal agency.

(8) SECRETARY.—The term "Secretary" means the Secretary of the Interior.

(9) STATE.—The term "State" means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern

Mariana Islands, and federally recognized Indian tribes.

SEC. 204. COORDINATION OF FEDERAL GROUND WATER RESEARCH PROGRAMS.

(a) DUTIES OF THE PRESIDENT.—

(1) The President shall coordinate activities conducted by Federal agencies to undertake assessment, management, and protection of ground water resources and to remedy ground water contamination and depletion. The President shall also assist the States in the conduct of such activities and shall disseminate information concerning those activities to State and local governments.

(2) The President shall establish within 90 days from the date of enactment of this title, an Interagency Ground Water Research Committee to provide for the coordination of research, development, demonstration, technology transfer, training, and information dissemination activities authorized in this title.

(b) INTERAGENCY GROUND WATER RESEARCH COMMITTEE.—

(1) The President shall appoint the members of the Interagency Ground Water Research Committee from each Federal agency involved in ground water-related activities, including the Environmental Protection

Agency, the Department of the Interior, the Department of Agriculture, and the Department of Health and Human Services. The Committee shall be co-chaired by the Secretary and the Administrator. The Committee shall hold at least 2 public meetings per year.

(2) The Interagency Ground Water Research Committee shall—

(A) identify major research data needs and scientific uncertainties regarding ground water assessment, monitoring, protection, management, and remediation,

(B) recommend overall priorities and a coordinated research plan to the President and to Congress for addressing the data needs and scientific uncertainties identified,

(C) otherwise facilitate, through joint funding and other means, interagency cooperation and coordination on ground water research, development and demonstration programs,

(D) consult with State and local governments, environmental organizations, scientific and professional organizations, industry, academia and other appropriate institutions to determine the ground water research and information needs of

State and local governments and other persons who have responsibilities for protecting or managing ground water resources, and

(E) recommend priorities for the assessment of ground water resources based on the use of such resources and the likelihood of such resources being contaminated.

SEC. 205. NATIONAL GROUND WATER ASSESSMENT PROGRAM.

(a) DUTIES OF THE PRESIDENT AND SECRETARY.—The President shall designate the Secretary of the Interior as the lead official for the purposes of carrying out the activities authorized in this section. The Secretary shall carry out such activities in consultation and coordination with the members of the Interagency Ground Water Research Committee and such other agencies as the President may designate.

(b) ASSESSMENT REPORT.—The Secretary, in consultation with State and local government officials and other persons, shall prepare a report which includes each of the following:

(1) An evaluation of existing ground water quality and quantity information systems, including a description of geographic areas and categories of data where there is a lack of information on quality or quantity.

(2) An evaluation of the utility and adequacy of existing ground water data collection and monitoring

programs conducted by Federal agencies, State and local governments, and other persons, including the adequacy of such programs for projecting long-term status and trends in ground water contamination and depletion.

(3) An evaluation of the availability and accessibility of existing ground water data to Federal agencies, State and local governments, and other persons.

(4) Recommendations on actions to be taken to better utilize existing information and recommendations for the improved collection of data and information.

(c) REPORT AND SUPPLEMENTS.—The Secretary shall complete a draft of the report under subsection (b) no later than 270 days after the date of the enactment of this title. The report shall then be made available for public comment for a period of at least 45 days. The final report shall be submitted to Congress and made available to the public no later than 1 year after the date of the enactment of this title. The report shall be updated every 2 years and supplements to the report containing such updates shall be submitted to Congress together with the report required under section 212.

(d) ESTABLISHMENT OF PROGRAM.—Within 2 years after the date of the enactment of this title, the Secretary shall establish and conduct a national ground water assessment program. The purposes of the program shall be to determine the location, hydrogeological properties, quantity, quality, and rates of depletion of ground water resources in the United States. The Secretary shall carry out the program both directly through the Department of the Interior and indirectly by providing assistance to other Federal agencies and State and local governments. The Secretary shall ensure access to the data and information gained under the program to Federal, State, and local agencies and other persons. The program shall meet each of the following requirements:

(1) The program shall assist State and local governments in the assessment, management, protection, and remediation of ground water resources and the design of ground water monitoring programs.

(2) The program shall coordinate activities relating to ground water among Federal agencies and State and local governments in order to avoid duplication of efforts.

(3) The program shall provide information regarding protocols and quality controls, recommend protocols to be used where appropriate, and provide guidance regarding the comparison of data collected under different methods and quality assurance programs. Such recommended protocols (A) shall not be construed as binding or retroactive, (B) shall not be

construed to apply to or impair the validity of any other protocols in any enforcement proceeding, and (C) shall not be construed to alter the authority of Federal agencies and State and local governments to determine where the use of such protocols is appropriate. The Secretary shall develop the protocols in consultation with the members of the Interagency Ground Water Research Committee and provide public notice and solicit comment upon proposed protocols.

(4) The program shall encourage the use of existing Federal-State programs.

(5) The program shall assist Federal and State agencies in meeting their data collection responsibilities under title XIV of the Public Health Service Act (relating to safe drinking water), the Comprehensive Environmental Response, Compensation and Liability Act of 1980, the Solid Waste Disposal Act, the Federal Water Pollution Control Act, Federal Insecticide, Fungicide, and Rodenticide Act, and other related statutes.

(6) The program shall improve the knowledge and understanding of the nature, extent, and causes of (A) ground water contamination (including contamination on a site specific basis), and (B) ground water depletion.

(7) The program shall provide information and data which will complement the collection of surface water quality data to provide integrated knowledge of water quality conditions within specific hydrologic regions and subregions. For this purpose, the Secretary is authorized to obtain any ground or surface water quality information in the possession of Federal agencies, States, or subdivisions thereof, and shall maintain the confidentiality of any such information and data in accordance with the provisions of section 552 of title 5, United States Code, and section 1905 of title 18, United States Code.

SEC. 206. NATIONAL RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAM FOR GROUND WATER PROTECTION AND MANAGEMENT.

(a) DUTIES OF THE PRESIDENT AND ADMINISTRATOR.—The President shall designate the Administrator as the lead official for the purposes of carrying out the activities authorized in this section. The Administrator shall carry out such activities in consultation and coordination with the members of the Interagency Ground Water Research Committee and such other agencies as the President may designate.

(b) ESTABLISHMENT OF PROGRAM.—The Administrator shall establish a research, development, and demonstration program for the protection, management, and remediation of ground water resources. Such program shall include conducting research, experiments, demonstrations, surveys, and studies relating to the sources, causes, effects, extent, prevention, detection, remediation, monitoring, and mitigation of ground water contamination, and the development and demonstration of effective, practical, and cost-efficient technologies for the prevention, detection, monitoring, remediation, and mitigation of ground water contamination. For the purposes of this section, "technologies" includes processes, practices, methods, and products.

(c) DEMONSTRATION PROGRAM.—The Administrator shall carry out a program to develop and demonstrate technologies which may be effective in controlling sources or potential sources of ground water contaminants or in mitigating ground water contamination. The Administrator shall develop and publish a list of priority needs with respect to source control technologies or mitigation technologies. The Administrator may enter into contracts or cooperative agreements with, or provide financial assistance in the form of grants to, public agencies and authorities, nonprofit institutions and organizations, or other persons, for projects to demonstrate such technologies, only if the Administrator makes each of the following findings:

(1) The project involved will serve to demonstrate a new or significantly improved technology or the feasibility and cost effectiveness of an existing but unproven technology.

(2) The project involved will not duplicate other Federal, State, local, or commercial efforts to demonstrate such technology.

(3) The demonstration of such technology will comply with all other laws for the protection of human health, welfare, and the environment.

(4) The project involved would meet a priority need previously identified by the Administrator.

(5) The project involved is not an "alternative or innovative treatment technology" eligible for demonstration assistance under section 311(b)(5) of the Comprehensive Environmental Response, Compensation and Liability Act.

(d) DEMONSTRATION PROGRAM ELEMENTS.—The demonstration program established by this section shall include solicitations for demonstration projects, selection of suitable demonstration projects from among those proposed, supervision of such demonstration projects, and evaluation of the results of the demonstration projects which are conducted. The Administrator shall publish regulations to assure the satisfactory implementation of each element of the program established by this section.

(e) SOLICITATION FOR DEMONSTRATION PROGRAMS.—Within 270 days after the date of the enactment of this title, and no less often than every 12 months thereafter, the Administrator shall publish a solicitation for proposals for projects to demonstrate technologies which may be effective in controlling sources or potential sources of contaminants or in mitigating ground water contamination. The solicitation shall prescribe the information to be included in each such proposal which shall permit the Administrator to assess the potential effectiveness and feasibility of the technology proposed to be demonstrated.

(f) APPLICATIONS FOR DEMONSTRATION PROJECTS.—Any person (including any public or private nonprofit entity) may submit an application to the Administrator in response to a solicitation under subsection (e). The application shall contain a demonstration plan setting forth how and when the proposed project is to be carried out and such other information as the Administrator may require.

(g) DEMONSTRATION PROJECT SELECTION.—In selecting technologies to be demonstrated, the Administrator shall fully review the applications submitted and shall evaluate each project on the basis of each of the following:

(1) The potential of the proposed technology effectively to control or mitigate sources or potential sources of contaminants, with emphasis upon those sources of contaminants which present the greatest risk to human health and the environment or the greatest likelihood of ground water contamination and which are not effectively controlled by existing technologies.

(2) The capability of the person or persons proposing the project to complete successfully the demonstration as described in the application and the willingness of such person to make the benefits of the technology widely available to the public in a timely manner.

(3) The likelihood that the demonstrated technology would have significant application.

The Administrator shall select, request further information on, or refuse to select a project for demonstration under this section within 135 days after receiving the completed application for such project. In the case of a refusal to select a project, the Administrator shall notify the applicant within such 135-day period of the reasons for the refusal. In each 12-month period the Administrator shall select at least 10 qualified demonstration projects for support according to the provisions of this section.

(h) SUPERVISION AND TESTING.—Each demonstration project under this section shall be performed by the applicant, or by a person satisfactory to the applicant, under the supervision of the Administrator. The Administrator and the applicant shall enter into a written agreement granting the Administrator the responsibility and authority for testing procedures, quality control, monitoring, and other measurements necessary to determine and evaluate the results of the demonstration project. The Administrator may pay the costs of testing, monitoring, quality control, and other measurements required by the Administrator to determine and evaluate the results of a demonstration project and the limitations of subsection (i) shall not apply to such costs.

(i) COST SHARING.—The Administrator shall not provide any Federal assistance for any project under this section to any applicant unless such applicant can demonstrate that it cannot obtain appropriate private financing on reasonable terms and conditions sufficient to carry out such project without such Federal assistance. The total Federal funds for any project under this section shall not exceed 50 percent of the total cost of such project estimated at the time of the award of such assistance.

(j) DEMONSTRATION OF COMPLIANCE.—In making the required finding of compliance in subsection (c)(3), the Administrator shall, after notice and opportunity for public comment, establish guidelines and procedures for issuing expedited demonstration permits or other regulatory approvals required to carry out such research or demonstration.

SEC. 207. GROUND WATER CONTAMINANT RISK ASSESSMENT ANALYSIS.

(a) Duties of the President and Administrator.—The President shall designate the Administrator as the lead official for the purposes of carrying out the activities authorized in this section. The Administrator shall carry out such activities in consultation and coordination with the members of the Interagency Ground Water Research Committee and such other agencies as the President may designate.

(b) Ground Water Risk Assessment Analyses.—The Administrator shall conduct and publish a risk assessment analysis for significant ground water contaminants. Such risk assessment analysis shall use scientifically-sound methodologies to assess the risk to human health and the environment associated with a range of concentrations of the ground water contaminant.

(c) Content of Analyses.—Each risk assessment analysis shall include—

(1) the most recent scientific knowledge on the physical, chemical, biological, and radiological proper-

ties of the contaminant and its effects on human health and the environment,

(2) an assessment of factors, including contaminant sources, variable aquifer conditions, and ground water uses, which may influence the effect of the contaminant on human health and the environment,

(3) an assessment of the assumptions, scientific uncertainties and data gaps contained in the risk assessment analysis, and

(4) a comparison of the risks posed by such contaminants to risks posed by other ground water contaminants.

(d) FORMAT.—The Administrator shall establish and use a standard format for the presentation of risk assessment analyses to facilitate the use of such analyses by State and local officials and the public.

(e) USE OF AVAILABLE DATA AND AUTHORITY TO CONDUCT ADDITIONAL STUDIES.—In carrying out this section, the Administrator shall use, to the fullest extent practicable, existing data or analyses developed by other agencies, including the Department of Health and Human Services. The Administrator shall also consider data and analyses developed pursuant to the Federal Water Pollution Control Act, title XIV of the Public Health Service Act (relating to safe drinking water), the Toxic Substances Control Act, the

Comprehensive Environmental Response, Compensation and Liability Act of 1980, the Superfund Amendments and Reauthorization Act of 1986, and the Federal Insecticide, Fungicide, and Rodenticide Act. The Administrator may conduct such additional studies under the authorities of such Acts to gather data necessary to reduce scientific uncertainties in the risk assessment analyses. Such additional studies may be conducted in consultation with the Department of Health and Human Services.

(f) TIMETABLE FOR PUBLICATION OF RISK ASSESSMENT ANALYSES.—The Administrator shall publish, with an opportunity for public notice and comment, risk assessment analyses for not less than 30 contaminants within 24 months after the date of enactment of this title, and not less than 30 additional contaminants within 36 months after the date of enactment of this title. The Administrator shall continue to publish such analyses for additional contaminants at a rate which is consistent with the needs of the State and local governments in developing ground water quality standards.

(g) PERIODIC REVIEW AND REVISION.—The Administrator shall periodically review and revise, with an opportunity for public notice and comment, published risk assessment analyses to ensure that they reflect developments in scientific data relevant to the contaminant.

SEC. 208. TECHNICAL ASSISTANCE, TRAINING, AND TECHNOLOGY TRANSFER.

(a) DUTIES OF THE PRESIDENT, SECRETARY, AND ADMINISTRATOR.—The President shall designate the Secretary as the lead official for the purposes of carrying out the activities authorized in this section relating to ground water assessment and shall designate the Administrator as the lead official for the purposes of carrying out the activities authorized in this section relating to source controls and mitigation of ground water contamination and remediation of ground water and health and environmental effects. The Secretary and the Administrator shall carry out their activities in consultation and coordination with the members of the Interagency Ground Water Research Committee and such other agencies as the President may designate.

(b) ASSISTANCE.—The Administrator and the Secretary are each authorized and directed to establish a program to provide technical assistance (1) between and among Federal agencies, and (2) to State and local governments through grants, loans, cooperative agreements, and contracts. Such technical assistance shall assist in the conduct of activities authorized under this title and in the collection, evaluation, and analysis of ground water data and information to assist such agencies and governments to undertake assessment, management, monitoring, protection, and remediation of ground water resources.

(c) RESEARCH AND SURVEYS.—Upon request by a State or local government, the Administrator and the Secretary (1) may each conduct research and make surveys concerning any specific problem of ground water contamination or depletion in cooperation with such government, and (2) may each make recommendations concerning solutions to such problem. The non-Federal share of the costs of such research and surveys shall be 50 percent.

(d) TRAINING.—In the course of carrying out this title, the Administrator and the Secretary are authorized to conduct training for personnel from Federal agencies, States, local governments, nonprofit organizations, and other persons, relating to the assessment, management, protection, and remediation of ground water resources, and the causes, effects, extent, prevention, detection, and mitigation of ground water contamination and depletion. The Administrator and the Secretary may establish reasonable fees for such training provided to non-Federal personnel.

(e) TECHNOLOGY TRANSFER.—The Administrator and the Secretary shall conduct a technology transfer program, including the collection and dissemination of information obtained by the activities authorized by this title. Such technology transfer shall be accomplished by publications, conferences, and other appropriate means and shall ensure that such information is available through the National Ground

Water Information Clearinghouse established under section 209.

(f) PUBLIC ACCESS.—Information obtained by the programs authorized by this title shall be made available to the public, subject to the provisions of section 552 of title 5, United States Code, and section 1905 of title 18, United States Code, and to other government agencies in a manner that will facilitate its dissemination, except that, upon a showing satisfactory to the Administrator or the Secretary by any person that records, reports, or information, or particular parts thereof, to which the Administrator or Secretary has access under this section, would, if made public, divulge methods or processes entitled to protection as trade secrets of such person, the Administrator or Secretary shall treat such record, report, or information or particular portion thereof as confidential in accordance with section 1905 of title 18, United States Code.

SEC. 209. NATIONAL GROUND WATER INFORMATION CLEARINGHOUSE.

(a) DUTIES OF THE PRESIDENT AND SECRETARY.—The President shall designate the Secretary of the Interior as the lead official for the purposes of carrying out the activities authorized in this section. The Secretary shall carry out such activities in consultation and coordination with the members of the Interagency Ground Water Research Committee and such other agencies as the President may designate.

(b) CLEARINGHOUSE.—The Secretary shall establish and maintain a National Ground Water Information Clearinghouse. The Clearinghouse shall be used to disseminate information to Federal agencies, State and local governments, and other persons on—

(1) ground water assessment, management, protection, and remediation,

(2) remedies for ground water contamination and depletion, and

(3) the relationship between ground water quality and quantity and surface water quality and quantity.

SEC. 210. ENVIRONMENTAL PROTECTION AGENCY GROUND WATER RESEARCH CAPABILITY IMPROVEMENTS.

(a) AUTHORITIES.—For the purposes of carrying out this title, the Administrator is authorized—

(1) to enter into contracts or cooperative agreements with, or make grants to, States, local governments, other appropriate public agencies and authorities, nonprofit organizations, and other persons,

(2) subject to the provisions of the Public Buildings Act of 1959, to construct and equip such facilities as may be necessary, and

(3) to use, on a reimbursable basis, facilities and personnel of existing Federal scientific laboratories and research centers.

(b) RESEARCH COMMITTEE.—The Administrator shall establish a media-specific research committee for ground water resources in addition to the media-specific research committees already established. The membership of the committee established pursuant to this subsection shall be broadly representative of the program and research concerns within the Environmental Protection Agency related to the protection, maintenance, and remediation of ground water resources.

(c) SCIENCE ADVISORY BOARD.—

(1) CONTINUING REVIEW.—In addition to such other duties as may be prescribed by the Administrator under this title, the Science Advisory Board established under the Environmental Research, Development, and Demonstration Act of 1978 (42 U.S.C. 4365) shall review on a continuing basis the ground water research programs of the Agency and submit periodic reports to Congress. The reports should include an evaluation of the progress made by the proposed research program of the Agency, the likelihood that the research program will provide the information needed for pending policy decisions or for State and local governments,

and the adequacy of resources to carry out the research program.

(2) COMMENT.—The Administrator shall request comments from the Science Advisory Board on the risk assessment analyses prepared by the Administrator under section 207. The Board shall respond, as it deems appropriate, within the time period applicable for the publication of the risk assessment analyses. This subsection shall under no circumstances be used to delay the final publication of ground water contaminant risk assessment analyses.

(d) FELLOWSHIPS.—The Administrator is authorized to establish and maintain research fellowships in the Agency and at public or nonprofit private educational institutions or research organizations for the purposes of this title.

(e) RESEARCH INSTITUTES.—

(1) GRANT PROGRAM.—The Administrator may make grants to institutions of higher learning or other research institutions (or consortia of such institutions) to establish and operate not more than 5 ground water research institutes in the United States.

(2) RESPONSIBILITIES OF THE INSTITUTES.—The responsibility of each ground water research institute established under this section shall include the conduct of research and training relating to the protec-

tion, maintenance, and remediation of ground water resources and the publication and dissemination of the results of such research.

(3) APPLICATIONS.—Any institution of higher learning or other research institution (or consortium of such institutions) interested in receiving a grant under this section shall submit to the Administrator an application in such form and containing such information as the Administrator may require by regulation.

(4) SELECTION CRITERIA.—The Administrator shall select recipients of grants under this section on the basis of the following criteria:

(A) Each research institute shall have available for carrying out this section demonstrated research resources.

(B) Each research institute shall have the capability to provide leadership in making national and regional contributions to the solution of both long range and immediate ground water contamination problems.

(C) Each research institute shall make a commitment to support ongoing ground water research programs with budgeted institutional funds.

(D) Each research institute shall have an interdisciplinary staff with demonstrated expertise in ground water management and research.

(5) Agency share.—The grant or grants made by the Administrator under this section with respect to the establishment and operation of a ground water research institute shall not exceed 50 percent of the costs of establishing and operating such institute and of the related activities carried out by the grant recipient or recipients.

(6) Limitation on use of funds.—No funds made available to carry out this section shall be used for the acquisition of real property (including buildings) or the construction or substantial modification of any building.

(7) Equitable distribution.—The Administrator shall equitably allocate the funds made available to carry out this section among the regions of the United States. One of the institutes shall be the National Center for Ground Water Research, a consortium between Oklahoma University, Oklahoma State University, and Rice University, except that paragraph (5) shall not apply to such Center.

(8) Technology transfer.—Not less than 5 percent of the funds made available to carry out this

section for any fiscal year shall be available to carry out technology transfer activities.

(9) PROPOSED RESEARCH PROGRAM.—Prior to and as a condition of the receipt each year of funds appropriated to carry out this section, each research institute established under this section shall submit to the Administrator for approval a ground water research program that includes assurances, satisfactory to the Administrator, that such program was developed in consultation with the States, local governmental entities, and other agencies and institutions within the region having ground water protection or management responsibilities and with interested members of the public. Such program shall include plans to promote research, training, information dissemination, and other activities meeting the needs of the region and the Nation, and shall encourage regional cooperation among institutions in research into areas of ground water protection, maintenance, and remediation that have a regional or national character.

(10) REVIEW AND EVALUATION.—

(A) PROCEDURES.—The Administrator shall establish procedures for a careful and detailed evaluation of each research institute to determine whether the quality and relevance of its ground water resources research and its effectiveness as an institution for planning, conducting, and arranging for such research warrants its continued support under this section in the national interest.

(B) EVALUATION.—The Administrator shall arrange for each of the research institutes supported under this section to be evaluated within two years after its establishment and to be reevaluated at intervals not to exceed five years. If, as a result of any such evaluation, the Administrator determines that a research institute does not qualify for further support under this section, then no further grants to such institute may be made until its qualification is reestablished to the satisfaction of the Administrator.

SEC. 211. MISCELLANEOUS PROVISIONS.

(a) WATER RESOURCE PROJECTS.—

(1) CONSIDERATION OF IMPACT ON GROUND WATER RESOURCES.—In the formulation and evaluation of water resource projects, the Secretary of the Army and the Secretary of the Interior shall consider the impact of the proposed project on ground water resources and the feasibility of measures to replenish and protect such resources.

(2) REVIEW OF EXISTING PROJECTS.—The Secretary of the Army is authorized to review the operation of water resources projects authorized for construction by the Secretary of the Army before the date of the enactment of this title and the Secretary of the Interior is authorized to review the operation of water resources projects authorized for construction by the Secretary of the Interior before such date. Such reviews shall be made to determine the need for and feasibility of modifications in the structures and operations of such projects for the purpose of replenishing and protecting ground water resources.

(b) INSTITUTE PRIORITIES.—Section 108 of the Water Resources Research Act of 1984 (Public Law 98-242; 98 Stat. 97, 98) is amended—

(1) in paragraph (6), by inserting ", contamination," after "Depletion", and

(2) in paragraph (8), by inserting "quality and quantity" after "water".

(c) STUDIES.—

(1) VOLATILE GROUND WATER CONTAMINANTS.—The Administrator, in cooperation with the State of New Jersey and appropriate local governments, shall study the feasibility of removal of volatile ground water contaminants in the New Jersey coastal

plain by induced air phase transport for the purpose of developing a plan for removal of such contaminants. The Administrator shall prepare a report on the results of such study, including recommendations for implementation of such plan.

(2) TRACE METAL LEACHING BY CORROSIVE GROUND WATER.—The Administrator, in cooperation with the State of New Jersey and appropriate local governments, shall study the problem of trace metal leaching by corrosive ground water at selected sites in the New Jersey coastal plain for the purpose of determining methods of reducing or controlling such problem. The Administrator shall prepare a report on the results of such study, including recommendations.

(3) GROUND WATER REPLENISHMENT AND CONTAMINATION.—The Administrator, in cooperation with the sanitation districts of Los Angeles County, California and regulatory agencies of the State of California, shall conduct a study of the feasibility of ground water replenishment with treated wastewater with particular emphasis on health effects related research recommended by the California State Scientific Advisory Panel on Groundwater Recharge. The Administrator shall prepare a report on the results of such studies.

(4) **Water pollution resulting from contaminated ground water.**—The Administrator, in cooperation with the State of New York and appropriate local governments, shall study the problem of pollution of the Buffalo River by contaminated ground water in Erie County, New York, for the purpose of determining methods of reducing or controlling such problem. The Administrator shall prepare a report on the results of such study, including recommendations.

(d) **Lake Okeechobee Ecosystem, Florida.**—

(1) **Research program.**—

(A) **In general.**—The Administrator, in cooperation with the Secretary of the Army, shall conduct a program of research at the Lake Okeechobee ecosystem on the relationship between surface and ground water quality and the management and control of aquatic plants. The Secretary of the Army shall provide such resources and services as may be necessary to assist the Administrator in conducting such program.

(B) **Program requirements.**—The program conducted under this paragraph shall—

(i) examine, interpret, and summarize existing data relating to surface and ground water quality and the management and control of aquatic plants, and identify the location of major collections of such data,

(ii) examine the impact of existing methods for the management and control of aquatic plants on the Lake Okeechobee ecosystem,

(iii) conduct any research which the Administrator determines is necessary for the development of effective methods of management and control of aquatic plants and surface and ground water quality, and

(iv) be conducted in coordination with similar programs conducted by other Federal agencies.

(C) MANAGEMENT AND CONTROL METHODS.—Methods developed under this paragraph shall—

(i) be capable of application in a variety of combinations as separate components of systems for such management and control,

(ii) be adaptable for application, without a significant loss of accuracy and utility, to a wide variety of surface and ground water ecosystems and regions of the United States, and

(iii) be compatible with all aspects of each ecosystem to which they may be applied.

(D) OUTSIDE RESEARCH.—Subject to the availability of appropriations, the Administrator and the Secretary of the Army may each enter into contracts for the performance of research required for the development of methods under this paragraph.

(E) PROVISION OF INFORMATION TO STATE AND LOCAL GOVERNMENTS.—The Administrator shall provide information about methods developed under this paragraph to any official of State or local government upon receipt by the A[illegible]istrator of a request submitted by the official.

(2) DEMONSTRATION PROJECT.—The Administrator shall conduct a project demonstrating methods developed under paragraph (1) at the Lake Okeechobee ecosystem. Such project shall—

(A) assess the utility of methods developed under paragraph (1) as components of a variety of comprehensive systems for the management and control of aquatic plants and surface and ground water quality, and

(B) identify any further research required to allow development of effective methods for the management and control of aquatic plants and surface and ground water quality.

(3) RECOMMENDATIONS OF THIRD PARTIES.—The Administrator shall solicit recommendations regarding activities under paragraphs (1) and (2) from—

(A) scientists other than those participating directly in activities under paragraphs (1) and (2), including scientists representative of the Federal, State, and local scientific communities, universities, and private industry, and

(B) management and operational personnel involved in the management and control of aquatic plants,

and shall utilize such recommendations in the development of methods under paragraph (1).

(4) COMPLETION OF RESEARCH AND DEMONSTRATION.—The Administrator shall complete the research program under paragraph (1) and demonstration project under paragraph (2) not later than 3 years after the date of the enactment of this title.

(5) PLAN FOR IMPLEMENTATION.—Not later than 180 days after the date of the enactment of this title, the Administrator and the Secretary of the Army

shall each transmit to the Congress a report outlining a plan for carrying out the functions of the Administrator or Secretary of the Army, as the case may be, with respect to the research program and demonstration project to be conducted under this subsection. Such reports shall each include a description of the cooperative measures to be undertaken by the Administrator or the Secretary of the Army, as the case may be.

(6) UTILIZATION BY DEPARTMENTS AND AGENCIES.—Any department or agency of the United States may utilize any recommendation contained in a report on the results of the research program and demonstration projects conducted under this subsection—

(A) if the recommendation may be utilized without interfering with any management or demonstration project already in progress, or

(B) after consultation with each person conducting such a management or demonstration project.

(7) LAKE OKEECHOBEE ECOSYSTEM DEFINED.—For the purposes of this subsection, the term "Lake Okeechobee ecosystem" means Lake Okeechobee, Florida, all rivers and streams entering into and carrying water away from such lake, the surrounding marsh

area, the associated 100-year flood plain, and associated ground water resources.

(e) AUTHORIZATION OF APPROPRIATION.—There is authorized to be appropriated to carry out this section $7,000,000 for fiscal years beginning after September 30, 1987. Upon request of the Secretary of the Army, the Administrator may transfer to the Secretary of the Army such funds as may be necessary for the Secretary of the Army to comply with the provisions of this section applicable to the Secretary of the Army.

SEC. 212. ANNUAL REPORT.

Not later than January 15, 1989, and each January 15 thereafter, the President shall prepare and submit to Congress an annual report on the activities carried out by the Administrator, the Secretary, the Interagency Ground Water Research Committee, other Federal agencies as appropriate, and State and local governments regarding ground water assessment, protection, management, and remediation activities under this title. The annual report shall contain a discussion of the ground water assessment and research findings to date, needs of the Federal Government and State and local governments, and an evaluation of the extent to which the programs authorized by this title are addressing those needs. The report shall also describe the ground water research and assessment programs for the agency members of the Interagency Ground Water Research Committee for the succeeding 2 fiscal years.

SEC. 213. PEER REVIEW.

Except as otherwise provided in this title, studies, reports, and results of research conducted under this title shall be reported and adopted only after appropriate peer review.

SEC. 214. AUTHORIZATION OF APPROPRIATIONS.

(a) In addition to such sums as may be otherwise authorized, there are authorized to be appropriated to the Environmental Protection Agency for the purposes of carrying out the provisions of this title, other than section 211, $10,000,000 for fiscal year 1988, $12,000,000 for fiscal year 1989, and $14,000,000 for fiscal year 1990.

(b) Any contract authority provided in this title shall be available only in amounts provided in advance in appropriations Acts.

TITLE III—AGRICULTURAL PRODUCTION AND WATER USE

SEC. 301. SHORT TITLE.

This title may be cited as the "Agricultural Ground Water Management Act of 1987".

SEC. 302. FINDINGS.

The Congress finds that—

(1) ground and surface waters are interconnected and the quality and availability of these waters are of critical importance to our Nation,

(2) agriculture is the largest single consumer of water in rural America, with irrigation used on more than 41,000,000 acres,

(3) 95 percent of all rural residents in the United States are dependent upon ground water as a source of potable water,

(4) ground and surface water contamination from a number of sources, including contamination from agricultural operations, is a major national concern which can cause adverse social, economic, health, and environmental impacts,

(5) technology and education on soil and tissue testing, in managing both economic and environmental concerns of agriculture, deserve renewed emphasis by the Department of Agriculture in view of changing farmer needs,

(6) careful selection of the proper combination of agricultural practices and technologies, including proper water management, will help farmers reduce the effect of agricultural practices on water quality,

(7) efficient plant use of agricultural nitrogen is essential to maximize the farmer's return on invest-

ment and to minimize agricultural nitrogen losses from erosion and leaching,

(8) least-cost production strategies continue to offer the best long-term hope for sustaining American agriculture,

(9) farmers must be fully informed to ensure that agricultural operations are agronomically, economically, and environmentally sound, and

(10) present water quality and use data collection, analysis, and information dissemination programs are insufficient to provide farmers and decision makers with the bases for formulating sound water quality and use policies and programs.

SEC. 303. AGRICULTURAL WATER QUALITY AND USE STUDY.

(a) IN GENERAL.—The Secretary of Agriculture shall conduct an investigation and analysis of the relationship between agricultural practices and water use and quality and shall, within 90 days of the date of the enactment of this title, submit a report to Congress on the results of the investigation and analysis. The report shall include—

(1) the current status and level of effort of programs at the Department of Agriculture to evaluate present agricultural water use and predict future use and availability of water for agricultural and rural residents,

(2) the current status and level of effort of programs at the Department of Agriculture to evaluate, prevent, and mitigate water quality problems in both surface and ground water,

(3) the current status of efforts to coordinate the undertakings described in paragraphs (1) and (2) both within the Department of Agriculture and within other departments and agencies of the Federal Government, including a detailed description of how the water quality and use issues are being included in management plans for lands of the Department of Agriculture,

(4) an estimate of the extent of the water quality problem, in both surface and ground water, due to agricultural operations and an examination of the extent to which these problems are due to identifiable organic and inorganic sources of pollution,

(5) an estimate of the availability of water for agricultural uses on a geographic area basis, based upon current and predicted levels of use and withdrawal,

(6) an analysis of the interrelationships and compounded problems, if any, between agricultural water use and water quality,

(7) the policy of the Department of Agriculture on water quality and use which should be used to guide

programs associated with agricultural and rural water needs, and

(8) specific recommendations for changes in existing programs and new initiatives in monitoring, research, extension, and technical assistance efforts to address present and potential water quality and quantity problems.

(b) The Secretary of Agriculture and the Administrator of the Environmental Protection Agency shall conduct and complete within 12 months of the date of enactment of this Act a joint study of the impact on ground water and agricultural interests of proposals to dredge sediments which contain PCB's from the Hudson River and dispose of such sediments on land.

SEC. 304. AGRICULTURAL NITROGEN BEST MANAGEMENT PRACTICES TASK FORCE.

(a) ESTABLISHMENT.—The Secretary of Agriculture shall establish an Agricultural Nitrogen Best Management Practices Task Force. The Secretary shall appoint as members of the Task Force—

(1) the Administrator of the Agricultural Research Service,

(2) the Administrator of the Extension Service,

(3) the Chief of the Soil Conservation Service,

(4) the Administrator of the Agricultural Stabilization and Conservation Service,

(5) the Administrator of the Cooperative State Research Service,

(6) the Manager of the National Fertilizer Development Center of the Tennessee Valley Authority,

(7) the Director of the Office of Ground Water Protection of the Environmental Protection Agency,

(8) one representative of persons engaged in the agricultural production,

(9) one representative of the fertilizer industry,

(10) one representative of State government,

(11) one representative of the public with expertise in agricultural practices, and

(12) the Director of the United States Geological Survey.

(b) FUNCTIONS.—The Task Force appointed under subsection (a) shall—

(1) review the status of current information on the relationship between agricultural nitrogen and water quality, including the quality of both surface and ground water,

(2) develop and improve agricultural best management practices, systems, and technologies for (A) improving nitrogen utilization in agricultural production,

and (B) reducing or mitigating any negative effects of agricultural nitrogen and environmental nitrogen on water quality, and

(3) develop educational and training materials for providing information and technical assistance to farmers through appropriate means to encourage the adoption of the recommendations developed under paragraph (2).

(c) REPORT.—The Task Force shall report to the Secretary of Agriculture and to Congress one year after the date of the enactment of this title and annually thereafter on the progress of its efforts under subsection (b). Each report shall include a description of—

(1) the extent of problems posed by agricultural nitrogen and environmental nitrogen for water quality,

(2) the agricultural best management practices recommended by the task force with particular emphasis on practices to minimize the impact of agricultural nitrogen and environmental nitrogen on ground and surface water quality,

(3) the means for disseminating to farmers and producers data and information relating to environmental nitrogen sources as they may impact on agricultural best management practices,

(4) the educational and training materials developed to promote adoption of agricultural best management practices and the strategy for their dissemination, and

(5) progress made by the agricultural community, to date, to address these problems, including progress in disseminating information to agricultural producers.

(d) DEFINITIONS.—For the purpose of this section—

(1) AGRICULTURAL NITROGEN.—The term "agricultural nitrogen" means nitrogen in all forms (whether manmade, chemical, or biological) which may be present or available for crop production including nitrogen supplied by leguminous plants, animal manures, decaying leaves, and other vegetation, commercial fertilizers, applied human and industrial sewage, and such other nitrogen sources that are within the control of a farmer or producer.

(2) ENVIRONMENTAL NITROGEN.—The term "environmental nitrogen" means nitrogen fixed or occurring in the soil by means not under the control of a farmer or producer, including nitrogen from naturally occurring sources, such as precipitation and dustfall, and nitrogen from non-naturally occurring sources, such as air and water pollution.

(3) AGRICULTURAL BEST MANAGEMENT PRACTICES.—The term "agricultural best management practices" means generally recognized management practices under the control of farmers engaged in crop production that may be designed to reduce or prevent contamination of ground and surface water.

SEC. 305. NONPOINT SOURCE MANAGEMENT PROGRAMS.

(a) STATE REPORTS AND MANAGEMENT PROGRAMS.—Section 319(c) of the Federal Water Pollution Control Act (33 U.S.C. 1329(c)) is amended by adding at the end thereof the following new paragraph:

"(3) CONSULTATION REQUIREMENT.—Any report required by subsection (a) and any management program and report required by subsection (b) shall be developed in consultation with the Agricultural Nitrogen Best Management Practices Task Force of the Department of Agriculture established by section 304 of the Agricultural Ground Water Management Act of 1987.".

(b) REPORTS OF THE ADMINISTRATOR OF EPA.—Section 319(m) of such Act (33 U.S.C. 1329(m)) is amended by adding at the end thereof the following new paragraph:

"(3) CONSULTATION REQUIREMENT.—In preparing the reports under this subsection, the Administrator shall consult the Agricultural Nitrogen Best Management Practices Task Force of the Department of Agriculture established by section 304 of the Agricultural Ground Water Management Act of 1987.".

SEC. 306. AUTHORIZATION.

There are authorized to be appropriated to carry out this title such sums as may be necessary for each of the first 3 fiscal years beginning after the date of the enactment of this title.

TITLE IV—GROUND WATER RADIUM CONTAMINATION

SEC. 401. ASSISTANCE FOR SMALL COMMUNITIES WITH GROUND WATER RADIUM CONTAMINATION.

(a) RADIUM REMOVAL DEMONSTRATION PROGRAM.—The Administrator of the Environmental Protection Agency, in cooperation with State public authorities, may assist local governments in demonstrating mitigation of radium contamination in ground water. Upon application of any State public authority, the Administrator may make a grant to that authority for such purposes. Assistance provided pursuant to this subsection shall be used for financing the acquisition and installation of ground water treatment technologies needed to remove radium from ground water used as a source of public drinking water for residents of small communities under the jurisdiction of such local governments.

(b) LEVEL OF CONTAMINATION.—A grant may only be made under subsection (a) for removal of radium from ground water if the level of contamination from such radium exceeds the maximum contaminant level for radium established under title XIV of the Public Health Service Act (relating to safe drinking water).

(c) PURPOSES OF GRANTS.—Funds made available through grants under subsection (a) may only be used by the grant recipient for one or both of the following purposes:

(1) Providing insurance or prepaying interest for local obligations issued by a local government to finance the acquisition and installation of treatment technologies described in subsection (a).

(2) Paying for the costs of administration for establishment and operation by such authority of a program to provide financing for such acquisition and installation.

(d) DEFINITIONS.—For purposes of this section—

(1) SMALL COMMUNITY.—The term "small community" means a political subdivision of a State the population of which does not exceed 20,000 individuals.

(2) STATE PUBLIC AUTHORITY.—The term "State public authority" means an agency or instrumentality of a State which is established for the pur-

pose of assisting local governments in financing capital improvements on a statewide or regional basis.

(e) AUTHORIZATION OF APPROPRIATIONS.—The following sums are authorized to be appropriated to carry out this section:

Fiscal Year	**Amount**
1988	$4,000,000
1989	$5,000,000
1990	$5,000,000.

Passed the House of Representatives December 2, 1987.

Attest: DONNALD K. ANDERSON,

Clerk.

GROUND WATER PROTECTION

THURSDAY, MARCH 24, 1988

U.S. SENATE, COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, SUBCOMMITTEES ON WATER RESOURCES, TRANSPORTATION, AND INFRASTRUCTURE AND HAZARDOUS WASTES AND TOXIC SUBSTANCES,

Washington, DC.

The subcommittee met, pursuant to notice, at 10:10 a.m., in room 406, Dirksen Senate Office Building, Hon. Daniel Patrick Moynihan (chairman of the Subcommittee on Water Resources, Transportation, and Infrastructure) presiding.

Present: Senators Moynihan, Durenberger, Reid, Baucus, Symms, and Breaux.

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, U.S. SENATOR FROM THE STATE OF NEW YORK

Senator MOYNIHAN. A very good morning to our guests of whom there is a reassuringly ample number which suggests that we have an issue here that on the whole question of ground water resources and water resources still has an active constituency in our country.

This is a joint subcommittee hearing with the Subcommittee on Water Resources, Transportation, and Infrastructure and the Subcommittee on Hazardous Wastes and Toxic Substances. These are chaired respectively by myself and my distinguished friend, the Senator from Montana, Senator Baucus.

We are here today to take testimony on three bills and hear any general observations that might wish to be made. There is S. 20, the Ground Water Protection Act. There is S. 1105, the Ground Water Research Act, and then sent to us from the House of Representatives there is H.R. 791, the Geological Survey Water Resources Organic Act, for which I have a letter from the distinguished chairman of the Committee on Public Works, Mr. Roe, which I would like to have inserted in the record at this point.

[The letter referred to follows:]

ROBERT A. ROE, New Jersey, CHAIRMAN

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JAMES H. SCHEUER, New York
MARILYN LLOYD, Tennessee
DOUG WALGREN, Pennsylvania
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U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE,
AND TECHNOLOGY
SUITE 2321 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-6371

MANUEL LUJAN, JR., New Mexico
ROBERT S. WALKER, Pennsylvania
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General Counsel
R. THOMAS WEIMER
Republican Staff Director

February 29, 1988

The Hon. Daniel P. Moynihan, Chairman
Subcommitte on Water Resources, Transportation,
and Infrastructure
Senate Committee on Environment & Public Works
Washington, D. C. 20510

Dear ~~Mr. Chairman~~: Pat

I am writing to bring to your attention my very great interest in working with you to accomplish another milestone this year on Ground Water policy; specifically, the bill H.R. 791, the "Geological Survey Water Resources Organic Act and Ground Water Contamination Information Act of 1987" which successfully passed the House on December 2, 1987, and represents the work of four House committees.

As you know from your joint field hearing with the Subcommittee on Natural Resources, Agriculture Research and Environment, ground water depletion and contamination are particularly acute problems in Long Island. The three million residents of Nassau and Suffolk counties rely exclusively on ground water drawn from a single aquifer for all of their water needs. That ground water resource, however, is being threatened both by chemical contamination and by ground water "mining", where water is withdrawn faster than it can be recharged through natural processes. As the witnesses at that hearing made clear, the continued economic viability of Long Island depends on an assured future supply of safe, clean ground water. Jim Larroca, President of the Long Island Association, emphasized, however, that the local communities simply lack the resources to collect the scientific and technical information they need to mount a comprehensive management plan to protect Long Island's ground water supplies.

This bill is vitally important and it is my hope that through the good work of your Committee we can see it enacted this year.

Please keep me advised.

Sincerely,

Best Wishes

Bob

ROBERT A. ROE
Chairman

RAR:Ksw

Senator MOYNIHAN. Also, we have just this day introduced a major piece of legislation, a comprehensive ground water legislation, S. 2091, introduced by Senator Durenberger. I am sure he will wish to speak more about that this morning.

I have a statement that I will place in the record.

[Senator Moynihan's statement follows:]

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, U.S. SENATOR FROM THE STATE OF NEW YORK

I am pleased to welcome you to the second joint hearing this session on ground water legislation. Joining me is Senator Max Baucus who chairs the Subcommittee on Hazardous Wastes and Toxic Substances. I chair the Subcommittee on Water Resources, Transportation, and Infrastructure.

The purpose of these hearings is to solicit comments on ground water bills pending before our committee, S. 20 the Ground Water Protection Act, S. 1105 the Ground Water Research Act, and H.R. 791, the Geological Survey Water Resources Organic Act, which came to this committee after surviving five committee reviews on the House side. Since our hearing February 23, Senator Durenberger has also introduced comprehensive ground water legislation, S. 2091, which I'm sure he will have more to say about this morning.

Our goal is to incorporate the best features of these bills and new ideas from our witnesses into an effective ground water bill we can send back to the House, thus beginning a conference.

At our last hearing we heard very interesting testimony from Lee Thomas, Administrator of the EPA and Assistant Secretary Ziglar of the Department of Interior. Various national groups such as ASWIPCA and the Western States Water Council added their expertise to our deliberations, also. In fact, the testimony was so interesting, that our members had many questions, thus requiring that we carry over one panel until today, so we appreciate our witnesses returning for our first panel.

We are planning one more hearing in April where we will concentrate on innovative State programs in ground water management, and where we will consider research at our land grant colleges and national water institutes as well. After that, we hope promptly to markup and send back a substitute bill to the House. Thus, even with our "short year" we may be able to complete a conference.

This morning we will hear from national organizations long active in ground water work.

Senator MOYNIHAN. We have a series of witnesses. However, first Senator Baucus would like to say a word. Senator Baucus?

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. Thank you, Mr. Chairman.

Without taking too much time, my major concern is the interaction between State legislation and Federal legislation. There is no easy answer, but I think we cannot let the States entirely address the ground water issue.

The second concern is the effect of toxic wastes. It's a major issue. Disposal is a major issue in our country. Although that's still pretty much a State issue, there also is a very direct Federal role there, too.

Without prejudging the solution, it would be my hope that a good part of these hearings would focus on that correct nexus, the balance between State and Federal roles in these areas.

Thank you.

[Senator Baucus' written statement follows:]

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Today's hearing is the second in a series of hearings chaired by Senator Moynihan and myself to determine if the Federal government should establish a nationwide policy to protect the country's ground water.

Instances where ground water has been contaminated by the uncontrolled disposal of hazardous waste has made us aware of the seriousness of this environmental problem. We know that once ground water is contaminated, it is very difficult, if not impossible, to reverse the damage.

Our first step is to increase our knowledge about ground water itself. Legislation pending before this Committee to increase federal research of ground water should be passed quickly.

I think it is also important for the federal government to understand how States are trying to protect ground water. My home state of Montana has adopted a policy of non-degradation, a policy a number of States have taken.

I have asked the General Accounting Office to provide Congress with a big picture review of what States are doing to protect ground water. This committee will hold a hearing on that subject in April.

Today's hearing will focus on the opinions of public interest groups, and of industries that would be affected by federal ground water legislation. Whether this is a matter best left to the states or one that requires a unifying Federal policy is the question before us.

From my perspective, separate State non-degradation policies and Federal hazardous waste clean-up standards are on a collision course. There are many conflicts between State and Federal law. We must be careful that while pursuing the best of intentions we construct a ground water policy that is consistent on both the State and Federal level.

The very nature of ground water presents a challenge. Montana can write a ground water protection law, but rarely, if ever, does a ground water supply reside within a single state. For example, the Ogallala acquifer stretches all the way from Montana to Texas.

I am beginning to believe the Congress will need to take the initiative to develop a Federal ground water policy. Today's witnesses will assist this Committee in making that determination.

Senator **Moynihan**. Senator Durenberger?

OPENING STATEMENT OF HON. DAVE DURENBERGER, U.S. SENATOR FROM THE STATE OF MINNESOTA

Senator **Durenberger**. Mr. Chairman, thank you.

At our last hearing I used an opening statement to discuss the role of the Federal Government vis-a-vis the States in protecting our ground water resources. This morning I would like to take a couple of minutes to address the second major issue in the ground water debate, which is the goal of nondegradation.

On February 25th, I introduced the comprehensive ground water protection bill the Chair has already referred to, which has a nondegradation goal in it. EPA chose that same day to release its strategy for preventing ground water contamination by pesticides. The EPA's strategy is based on a different philosophy which is called differential protection.

There are two basic propositions that make up the differential protection strategy. The first is that we can identify safe levels of ground water contamination and that we can manage our activities so that the safe level for each contaminant will not be exceeded.

The second proposition is that we can classify ground water resources according to their use, their value, or their vulnerability, providing extra protection for some vulnerable supplies and allowing exceedence of the safe levels at others, which we say are already damaged or unlikely to be used for human consumption.

I have opposed the ground water protection strategy based on differential protection, and I'll give you two reasons this morning and I'm going to ask some questions on this issue. First, it's unworkable and, second, it is unfair.

Differential protection in practice is an extraordinarily complex strategy. It requires a great deal more information than we currently have, and perhaps more information than we can ever acquire. We don't know enough about the health and environmental effects of most contaminants to set safe levels of exposure.

The Pesticide Office, which has announced the policy, has only made a small beginning implementing a 1972 law requiring health and safety data for the pesticides already registered. At the current pace, the EPA won't have complete health and safety data on the 600 pesticides in use already until the year 2015. Yet, EPA has proposed an extraordinarily complex scheme to manage pesticides on a site-specific basis to prevent contamination above safe levels.

We don't know enough about the transport of contaminants in soil and water or about the ground water characteristics at specific sites to manage our activities with the precision that is implied in a differential protection strategy.

Sure, we can say that ground water in one location is relatively more vulnerable to contamination than ground water in some other location, but we can't know on a site-specific basis precisely how a discharge will affect ground water quality. We can't even do that with a relatively simple resource like air quality.

Think of our struggles to meet the ozone and the carbon monoxide standard for ambient air quality in urban areas and the large margin of error in that program caused by poor inventories and simplistic models. How are we ever going to implement a site-specific strategy for a vastly more complex resource like ground water?

Yet, that is the strategy of differential protection. Protected for its use, but allow contamination right up to the level which an omniscient EPA says is safe. In my book, Mr. Chairman, it can't be done.

The different protection philosophy overestimates our understanding of the resource. Saying that it's a job for the States doesn't solve the problem. It isn't a question of proximity to the resource. It's a question of knowing how the resource functions.

Secondly, I said differential protection is not a fair policy. Many times I and others here have raised the issue of small places and their fate under this policy. Ground water is to be protected differentially based on how it is used, and for EPA that means an aquifer used by a large number of Americans deserves more protection than the ground water that supplies a small town or a few rural families. Rural America doesn't have to be at the low end of the differential protection policy.

But it is also a question of fairness to future Americans. Ground water quality is intergenerational. It is something that we pass on to posterity. We have no idea how future Americans will use that resource, so we have no right to needlessly limit their choices by intentionally degrading what we think we don't need.

Differential protection is not a strategy for resource protection. It is a strategy to protect the interests of current users of the resource. It is akin to flaring natural gas or letting a coal seam burn because we have no plan to mine it. It is the opposite, Mr. Chairman, of stewardship.

The differential protection philosophy asks the wrong question. It asks, How much can we pollute? It asks, Which resources can we ignore? But it never asks, What's the best we can do to prevent contamination?

Some will say this morning that nondegradation, the alternative to differential protection, is simplistic and that it threatens to shut down all human activity. Well, I have introduced a bill with a nondegradation goal. Some of the people here are cosponsors. It doesn't require that ground water be protected to background levels. It doesn't prohibit every alteration of the existing character of the resource. It isn't based on the expectation that all discharges will be halted. It has a nondegradation goal.

The goal is important. The nondegradation philosophy forces us in this generation to ask the question: what is the best we can do to prevent contamination? We might be able to do much better than the safe level if we try to do the best. We may be able to pass on a resource comparable to the pristine resource we inherited if we try to do our best.

Mr. Chairman, the differential protection strategy is founded on one of the faults of human nature, pride. We think we are the masters of the resource, that we can fully understand its processes and manage its qualities with mechanical precision. The chemist in his lab working day and night to find a perfect poison for the weeds in the bean field assumes that the rest of us know enough to prevent that poison from running off into a stream or running into the aquifer where it may injure fish or fowl or families. We don't. We don't know that much.

Non degradation is based on a different view of our knowledge. It is not an attempt to end the chemical revolution. We want the benefits of these materials in our manufacturing, in our mining, in our agriculture, and in our commerce, but as part of the bargain we need to acknowledge our capacity for error or misjudgment and to recognize those limitations, to take a path that requires more than protecting our own interests.

We need to commit to a strategy that protects the resource, that requires our best efforts to prevent this degradation.

Thank you, Mr. Chairman.

Senator **Moynihan**. Thank you, Senator Durenberger, for an extraordinarily powerful statement.

Senator Reid.

OPENING STATEMENT OF HON. HARRY REID, U.S. SENATOR FROM THE STATE OF NEVADA

Senator **Reid**. Thank you, Mr. Chairman.

I apologize for having to leave this hearing, but I'm going to go to a hearing shortly in which you've shown great interest. The Finance Committee is marking up a bill.

Senator **Moynihan**. On the bond financing of high speed rail, yes.

Senator **Reid**. I'm going to go testify there.

I appreciate your allowing me this opportunity to make my statement.

Mr. Chairman, the availability, management, protection, and monitoring of ground water are, of course, of concern. I look forward to this testimony, some of which I've already reviewed, on the Federal role relative to ground water.

Previous testimony before this committee has indicated that a number of Federal agencies are conducting research into ground water. It's becoming apparent to these Federal agencies and to this Congress that the increased efforts must be made to coordinate this research.

Serious problems are faced at the State and local levels with the quantity and the quality of our ground water. Duplication of efforts, lack of coordination, and poor dissemination of research results cannot, I believe, be tolerated. We must insure that our money is spent wisely on ground water problems and research.

We must also insure that qualified professionals are available to spend wisely the limited dollars that we have. We must train more ground water professionals to deal with our increasingly complex and difficult ground water problems.

Our laws are becoming increasingly complicated also. These laws were intended to solve and prevent some serious ground water problems. Well-educated, experienced professionals are required to insure that our laws produce intended results.

With those thoughts in mind, I introduced S. 2191 last week to authorize a western center for nuclear and ground water research. This center would utilize the existing research base in Nevada to help address serious problems of local and national concern.

I note, Mr. Chairman, in the testimony of one of our witnesses, Mr. Lehr, he states:

> Efforts are underway at the environmental monitoring systems laboratory in Las Vegas to develop methods for extracting truly representative ground water samples at lower cost. This research has broad application and interest to decisionmakers at the Federal, State, and local government levels as well as to industry.

Mr. Chairman, this is only one of many agencies that is conducting research in Nevada regarding ground water. The United States Geological Survey, the Department of Energy, the Desert Research Institute, and I could go on with a number of agencies that are all doing research, none of which is coordinated.

My bill would establish a consortium of Federal and academic institutions to focus their resources and attention on the isolation of hazardous and nuclear waste from our environment and also look into basic ground water problems. Existing research at these institutions in ground water should be enhanced through the pooling of resources. The inclusion of Nevada's university into the research consortium should permit increased opportunities for the training of more professionals.

The bill would promote increased coordination of research at the working level, and I believe this is exactly where we in Congress want to see the results of our efforts.

Mr. Chairman, I hope that my colleagues will support these efforts to strengthen the ties between our Federal and academic institutions. I support the various research institutions that already exist in many other regions of the Nation.

The problems that we face in the western United States and in Nevada are not only problems for our States, but for the Nation as well. The solutions to our problems in the western part of this country may be solutions to some of the Nation's problems as well.

Thank you very much, Mr. Chairman.

Senator **MOYNIHAN**. May I thank you, Senator. I think that is, at least to this Senator, an instantly compelling thought. I think the Nation owes that to Nevada.

I've just seen your bill and I might be added as a cosponsor, if you would. It's the western center for nuclear and ground water research. We've been blowing a lot of holes in your State for some time now, and what's going on down there?

Senator **REID**. Also, and I didn't want to get into this here but you brought it up, we have about 70,000 tons of high-level nuclear waste that are pointed in that direction also. One of the big concerns we have is ground water. This Congress recently purchased some very sensitive lands that have water on them in an area near this. There are some only species of certain animals in these waters. There's been almost no research to determine what this nuclear waste being buried there will do to this unique source of water.

Thank you very much.

Senator **MOYNIHAN**. It's fair. If there's anybody in the audience who doesn't know this, it's worth thinking about. We're going to have to dispose of nuclear waste that has a half-life of 20,000 years. That's when half the radiation will have been expended; the rest will tail out to another 80,000 or 100,000 years.

The species does not have any experience with that. We are witness to an extraordinarily stable political system, a political system without equal in history which has been in place for two centuries. Two centuries, I think that's 0.01 percent of 20,000. It challenges us in ways unknown to history. It's worthy of our efforts.

I would also like to record that statements from Senators Burdick, Warner, and Pressler will be in the record at this point.

[The statements referred to follow:]

STATEMENT OF HON. QUENTIN N. BURDICK, U.S. SENATOR FROM THE STATE OF NORTH DAKOTA

I am pleased to join my colleagues, Senators Moynihan and Baucus in this second hearing on national ground water legislation. We look forward to a third hearing in April which will focus on innovative State ground water programs.

Ground water is our lifeblood. In rural areas up to 97 percent of our citizens use ground water for drinking. Our ground water resources make up a water supply fifty times greater than that available from surface water sources—rivers and lakes.

But that supply is not inexhaustible. Even the huge Ogallala aquifer—which covers eight great plains States—is being pumped down faster than nature replenishes it. This aquifer nourishes some of the most productive agricultural land in America.

Pollution threatens the good quality of our ground water. In most rural areas water is not treated, aside from some chlorination, before it is consumed as drinking water. Over 8,000 private, public, and industrial wells have been closed because of toxic contamination.

The Superfund, clean water and safe drinking water amendments, which have come out of this committee can make a major difference in our Nation's water quality, if we can get adequate funding for their implemention.

But my colleagues and I believe that a new Federal ground water law is necessary to protect our ground water resources. We believe that S. 20 and S. 1105 are steps in the right direction. We feel ground water management responsibility lies primarily with the States.

However, Federal assistance will be provided for financial and technical support. I have introduced an amendment to S. 1105 to develop the best management practices in agriculture to reduce nitrogen in surface and ground water.

I look forward today to hearing from the witnesses as to how we can improve these bills to forge a good partnership between the States and Federal Government.

OPENING STATEMENT OF HON. JOHN W. WARNER, U.S. SENATOR FROM THE COMMONWEALTH OF VIRGINIA

Maintaining and improving this Nation's ground water resources is essential as our reliance upon these great unseen reservoirs, that provide the primary drinking water source for half of our population represents one of the greatest environmental challenges to all of us.

Even though it is recognized that every State has experienced some degree of ground water contamination, because of the nature of ground water with its vast holding tanks called aquifers, assessing the extent of the contamination of a national basis is not yet possible. This fact is of great concern to me. According to the report prepared by the Worldwatch Institute entitled "State of the World—1988," it is reported that over 200 substances have been identified in the Nation's underground water supplies, including 175 organic chemicals. Thirty-two of these organics and five metals are known or suspected carcinogens. Most of these toxic chemicals remain unregulated or unmonitored. EPA, which has the tremendous task for developing safe standards for these chemicals, have only set drinking water standards for about two dozen of the hundreds of substances detected in ground water.

In my home State of Virginia where there is an abundant supply of ground water that has been important in Virginia's past and is the source of controversy today, the quantity and quality of these vast reservoirs will play a critical role in the future development of the Commonwealth.

Recently, in December of last year, the new Chesapeake Bay agreement was signed by the Governors of Virginia, Maryland, and Pennsylvania, the Mayor of the District of Columbia, the Chesapeake Bay Commission, and for the Federal Government, the Environmental Protection Agency.

This historic agreement in recognizing the Chesapeake Bay as a national treasure and as a resource of worldwide significance, acknowledges the need to manage ground water to protect the water quality of the Chesapeake Bay and restore its valuable resources.

EPA and State governments have been making progress in developing comprehensive ground water protection programs for the past few years and I am pleased that my home State of Virginia has also made good progress in this area. These strategies are designed to clearly determine adequate protection measures required for their ground water resources.

I want to compliment my home State's program and encourage the Commonwealth to move ahead towards implementing a program that has great promise and potential to provide adequate resources for furure generations.

Under the direction of the States Ground Water Protection Steering Committee, a statewide strategy released last May has proved to be one of the country's best. This austere group under the leadership of Governor Baliles deserves to be recognized as our country forges ahead to protect our Nation's ground water resources. Virginia's program has identified locating potable ground water supplies that are highly susceptible to pollution, the technical report revises ground water standards, it calls for a statewide data management program and from the local level moves ahead to work with individual counties.

I view S. 1105 as providing needed research funds that State and local government entities need to gain a far better understanding on how to proceed to protect ground water. I am however concerned about the funding level that is being requested in the bill. In times of fiscal constraint I recognize that on balance a number of other environmental protection programs may also require additional Federal support.

I look forward to hearing from State governments on their role and responsibilities in carrying out ground water protection programs in the future. I thank the two distinguished chairmen for holding these most important hearings.

STATEMENT OF HON. LARRY PRESSLER, U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Mr. Chairman, I commend you for scheduling this second hearing on ground water. We need to carefully examine this issue which can have serious health implications for people.

In my home State of South Dakota, ground water quality has been a matter of concern for several years. Several rural water and municipal water delivery systems that utilize ground water are struggling with increasing levels of nitrates. As presented elsewhere in testimony submitted to this committee, excessive nitrate levels in drinking water have been implicated in a condition called methemoglobinemia or "blue baby disease". The Big Sioux Aquifer Water Quality Study surveyed physicians in the area for a potential relationship between blue baby syndrome and nitrate levels in water supplies.

To address this issue South Dakota's Department of Water and Natural Resources has already taken several of the steps outlined in the various ground water bills before Congress. Principally, a statewide ground water protection strategy has been developed which incorporates aquifer mapping, monitoring, improved management through existing programs, permitting, adopting of numeric standards, special studies, wellhead protection and interagency cooperation. The State legislature also considered additional ground water legislation this year. South Dakota is taking a very active role in protecting ground water quality.

Each State has different ground water conditions and problems and must be able to address its situation in its own manner. The States need assistance with research and technology transfer, not arbitrary and onerous Federal regulations.

Mr. Chairman, I look forward to working with you and the other members on this pressing matter.

Senator MOYNIHAN. Senator Reid, thank you. We know that you have to be at the Finance Committee.

Let us get on with our morning's testimony. Would the witnesses come forward: Dr. Clark of The Conservation Foundation; Ms. Velma Smith, who is director of ground water projects for the Environmental Policy Institute; Mr. Scott Cunningham, on behalf of the Chemical Manufacturers Association. Mr. Cunningham, you will be accompanied by Mr. Allan Elger of the Dupont Corporation. Mr. Elger, we welcome you. We also have Mr. Al Giese, on behalf of the Fertilizer Institute.

As is our practice, we will hear from our witnesses in the order in which they appear on the witness list.

Dr. Clark, good morning. We welcome you, sir.

STATEMENT OF EDWIN H. CLARK II, VICE PRESIDENT, THE CONSERVATION FOUNDATION

Mr. CLARK. Mr. Chairman and other distinguished members of this committee.

Senator MOYNIHAN. There are lots of chairmen around.

Mr. CLARK. I am Edwin Clark, vice president of The Conservation Foundation, a nonprofit, policy research and consensus-building organization dedicated to improving the quality of the environment and the wise use of the earth's resources.

I am very pleased to have the opportunity to testify before you today——

Senator MOYNIHAN. Let me ask the guests—there's a lot of rustling going on in the back there. Dr. Clark, perhaps you might want to bring that microphone a little bit forward.

Mr. CLARK. I am pleased to have the opportunity to testify before you today on S. 20, S. 1005, and other ground water protection issues. The Conservation Foundation has been involved in groundwater issues for a number of years. Much of this activity was conducted under the auspices of the National Groundwater Policy Forum which we sponsored in association with the National Governors Association. I see you already have a copy of the publication of the final report that the Forum put out.

Among its 17 members, the Forum had three governors, other State and local officials, chairmen of major corporations, heads of environmental organizations, and some top ground water professionals.

The forum came to several conclusions which I think are important to the hearings today. The first of these is that the lead responsibility for ground water protection should clearly lie with the States. The variability of ground water resources, their geographic occurrence, their physical and chemical properties, uses, and sources of contamination demand local flexibility.

The second recommendation is that Congress should enact national ground water legislation which would provide the impetus for and create the framework for the States to undertake the rigorous, comprehensive ground water management and protection programs we think are necessary.

The Forum recommended this legislation should establish a national goal for groundwater protection, specify the contents of the State programs, allow for limited Federal oversight of these programs, provide for Federal technical and financial assistance to the States, and impose limited sanctions on States which do not exercise their responsibilities.

The third recommendation of the Forum is that the States should adopt a truly comprehensive management program for their groundwater resources. This program, as set out in the Forum's report, should consist, we believe, of 10 elements. The first is a comprehensive mapping of aquifer systems and their associated recharge and discharge areas; in other words, learning something about the resource that they're trying to protect and manage.

The second element was anticipatory classification of aquifers. This is an issue on which I think maybe Senator Durenberger and we would disagree.

The third element was ambient ground water standards based on scientific risk assessments.

The fourth element was authorities for imposing controls upon all significant sources of contamination, along with a fifth element, effective enforcement provisions for these controls.

The next element was programs for monitoring data collection and data analysis; in other words, again, learning more about this resource that we're trying to protect.

The next element was surface use restrictions to protect ground water quality. In many cases the location of facilities is going to have to be associated with the controls placed upon them in order to protect the resource.

Finally, we had some recommendations about programs to coordinate the groundwater management programs with other Federal programs such as ground water withdrawals, surface water management, agricultural programs, and other natural resource programs.

These were the 10 elements that we believe should be in the State programs in order to do a reasonable job. The bills your committee is considering today respond to some but not all of the forum's recommendations. Two of the bills, S. 1105 and H.R. 791, relate only to research and technical assistance. This is a vital component of the overall effort, but is, of course, by itself only a first step. The other elements should not be postponed until this research is completed. To do so would only insure that we would ultimately obtain a thorough understanding of how seriously we had contaminated this resource.

S. 20 is the only one of the bills that attempts to provide a complete management approach. It includes many of the elements of the program that the Forum recommended, but is, I believe, lacking in several respects.

It provides no national goal. It provides a relatively weak framework for the State programs and relatively weak criteria for deciding whether they are adequate. It provides little real incentive to the States to exercise their responsibilities to manage this resource.

These we think are the three major weaknesses, and we would encourage the committee to correct them in S. 20 and to develop it into the comprehensive groundwater management bill that the Nation so badly needs.

Mr. Chairman, I have prepared a longer testimony which I submitted to the committee and I would like to have entered into the record.

Senator MOYNIHAN. Dr. Clark, I would like to express the appreciation of this committee that you come with thoroughly capable testimony and get done with dispatch and say pleasant things about S. 20.

Mr. CLARK. It was my pleasure, sir.

Senator MOYNIHAN. I think on behalf of Senator Durenberger and Senator Baucus, they would agree to say that something is only a first step is not to suggest that it's unnecessary?

Mr. CLARK. No. We agree that this sort of research is necessary and, in fact, one of the components of the program we recommend.

Senator MOYNIHAN. We thank you very much, sir.

Ms. Smith, who is, as I said, director of ground water projects for the Environmental Policy Institute.

STATEMENT OF VELMA SMITH, DIRECTOR OF GROUND WATER PROJECTS, ENVIRONMENTAL POLICY INSTITUTE

Ms. SMITH. Thank you, Mr. Chairman. Good morning.

Mr. Chairman, my written testimony offers a brief perspective on the extent of the Nation's ground water problems. Due to the time limitations, I'm not going to go into that detail. Instead, I would like to use my time this morning simply to share with you some ideas for national ground water legislation that derive from meetings which have been held among a number of environmental organizations. Those groups—the Environmental Policy Institute, the National Wildlife Federation, Natural Resources Defense Council, Environmental Defense Fund, Clean Water Action Project, U.S. Public Interest Research Group, Friends of the Earth, the Isaac Walton League, and the National Audubon Society are happy to have this opportunity to urge you to adopt comprehensive Federal ground water protection legislation, and we would like to see that legislation embody the following principles:

First, we believe we must recognize that ground water will not be protected by programs that merely respond to contamination. There is widespread agreement and painful evidence that ground water cleanup is technically difficult and expensive. Yet, most governmental resources devoted to ground water remain directed toward cleanup, not prevention.

Borrowing from the Clean Water Act, we would call first for a national goal to protect and enhance the physical, chemical, and biological integrity of the Nation's ground water resource. This ambitious goal should guide both Federal and State policy decisions with a determination that no avoidable pollution is acceptable.

At your last hearing on this subject, Mr. Chairman, the EPA Administrator, Lee Thomas, spoke critically of such a goal and seemed to dismiss a nondegradation goal as unworkable. We are, frankly, disappointed with this sort of negative response to a basic and important principle. We ask simply for adoption of a goal which is worth striving for, if not actually within our reach today.

If we were engaged in a similar debate in another area, would we encounter such distress over, for example, a goal of quality education for all children or ridding all schools of drugs? We think not. Goals in and of themselves are not workable or unworkable. Goals are worthy or unworthy of our efforts, and programs to strive toward those goals and then be judged as workable and unworkable.

Second, we believe that the ultimate answers to ground water protection cannot ignore the connection of ground water to surface water and the interrelationships of other environmental media with ground water. Therefore, we would seek a Federal ground water program that will stop the national pollution shell game and instead seriously promote waste reduction and improved chemical efficiency.

We would recommend that the Nation adopt 5-, 10-, and 15-year target numerical goals for waste reduction, and we will urge the Federal Government provide technical and financial assistance to States for targeted research and demonstration projects on waste reduction, reuse, and recycling.

Third, we cannot let standard setting set the pace for pollution control. A look at our experience with standard setting, data gathering, and risk assessment on a chemical-by-chemical basis with other Federal laws indicates that that approach is less than expeditious and fraught with problems and uncertainty.

Numerical water quality standards have a role in resource protection, but they cannot serve us effectively if we use them either as the sole basis for action or as a government-sanctioned license to pollute. The first line of defense in our view must be source controls, not water quality standards. We believe that effective ground water protection throughout the Nation will occur only when the Federal Government acts to adopt a national program of source controls to minimize or eliminate discharges of pollutants and toxic chemicals to ground water.

A source control approach is the most direct approach to pollution abatement. Indeed, it is where any ground water protection scheme must eventually arrive.

For certain sources of contamination, we believe that the first level of control should be specified directly in Federal legislation, much in the manner that Congress dealt with underground storage tanks and the banning of bare still tanks.

Beyond these basic statutory standard, we would call for Federal legislation to direct EPA to establish two additional levels of source controls, best practicable methods and best available methods. This two-tiered approach would in our view provide for reasonable consideration of economic and technological constraints to pollution prevention.

The States should then be empowered to build upon minimum Federal requirements. They should be provided with sufficient flexibility to authorize alternative, but equally effective means of achieving pollution prevention and waste reduction, but they should not in our view be provided with the flexibility to choose not to apply protection toward all or a portion of their ground water resources.

Fourth, effective ground water protection programs must be comprehensive. We believe that we cannot apply controls only to the easy targets, the large industrial facilities, and expect to make the kind of improvements that are necessary. With ground water, we must address point and nonpoint sources, and we must effect changes in the behavior of polluters who have previously escaped or only been lightly touched by environmental regulation.

Fifth, the Federal ground water protection program must provide for fair and equitable treatment of all citizens regardless of their place of residence. Just as citizens of a particular State should not be denied minimum national protections, citizens of rural areas must not be discriminated against through a program that ignores the need of noncommunity well users.

Thus, we would support adoption of a national goal of safe drinking water for all Americans, not just those served by public water supplies. We recommend that States be required to set up programs for water quality monitoring and water well replacement for private well owners.

Further, we urge Congress to call a halt to any Federal program or policy such as EPA's ground water classification proposals which would allow for ground water pollution simply on the rationale that only small populations will be affected.

Six, national ground water law must reject the notion that resource lends itself to control programs based on predictions of an assimilative capacity or calculations of acceptable pollutant loadings. Our aim must be to protect the full resource, not degrade selected segments of it.

In this context, however, we believe that ground water classification based on adequate data can be used to further broad-base protection goals. Anticipatory ground water classification, as Dr. Clark alluded to, should be used to provide an additional level of protection for particularly vulnerable or particularly crucial ground water resources. In no case should classification, however, be used to lessen the stringency of established source control standards.

Seventh, water quality standards best serve the purposes of ground water protection when they function as an adjunct to source controls, not a license to pollute. We believe that ground water quality standards should be based not only on human health considerations, but also on environmental impact.

Further, we believe that selected percentages of ground water standards should be used to trigger appropriate investigations and response actions to address ground water discharges. Standards then become enforceable, not obstacles to enforcement.

Finally, we must set aside the misconception that the States will succeed in protecting ground water without significant Federal involvement. It is time or past time for the Federal Government to assert its rightful role for the protection of a natural resource which we share with citizens in all States and with future generations.

If ground water programs truly hold some hope of being effective, of providing equal protection for citizens from Minnesota to Mississippi, of lessening the likelihood of pollution havens in economically depressed areas, and of leaving future generations with a clean water supply, then we must place the Federal Government in a leadership role. There must be a Federal gorilla in the closet.

We agree that the States and the local governments as well have an important role in ground water protection, but to those who would argue that ground water protection duties should be placed exclusively with the States, we must ask, What is it that gives the public any confidence that the ground water situation will improve? After all, the States have had the authority to act and the contamination problems that have now finally driven us toward this national debate have happened, as it were, on their watch.

In conclusion, Mr. Chairman, we would again remind the committee that what were once so-called isolated instances of ground water pollution now have cost us a great deal not only in terms of clean-up dollars, but also in needlessly squandered public trust.

While we see no sense in deploring what we haven't done, we also see no sense in delay. We would urge the Members of Congress to set out a range of options for action, including ones based on the principles I have outlined. We ask you to scrutinize these options and then choose the most effective, equitable, and expeditious means of protecting the Nation's ground water.

We think that the members of this committee have met great strides in that area, and we commend those members who introduced S. 20 as essentially the vehicle to get us off the dime and get this discussion started.

We do think that S. 1105—the Environmental Policy Institute believes that S. 1105 is a worthy vehicle for research and a research amendment to a larger regulatory bill. My written testimony points out some problems that we have with S. 20 and we would prefer, greatly prefer, that S. 2091, if I get the number correctly, the larger, comprehensive bill that was introduced by Senators Durenberger and Baucus and some of the other Senators a couple of weeks ago be used as the vehicle for continuing this discussion on a comprehensive regulatory program.

Thank you, Mr. Chairman.

Senator MOYNIHAN. We thank you, Ms. Smith.

Next is Mr. Cunningham on behalf of the Chemical Manufacturers Association. Mr. Cunningham is accompanied by Allan Elger of the Dupont Corp.

Mr. Cunningham, good morning.

STATEMENT OF SCOTT CUNNINGHAM, ON BEHALF OF THE CHEMICAL MANUFACTURERS ASSOCIATION, ACCOMPANIED BY ALLAN P. EGLER, DUPONT CORP.

Mr. CUNNINGHAM. Good morning, Mr. Chairman. We also have submitted a written statement.

Senator MOYNIHAN. Yes. We have it and we'd be very happy to put it in the record.

Mr. CUNNINGHAM. Thank you.

CMA believes this committee is clearly at an important juncture in deciding how best to protect our Nation's ground water resources. I hope my remarks today on behalf of CMA will offer useful suggestions that will assist the committee in moving constructively and responsibly on ground water issues.

In considering the steps to take now, we should first look at the path that has already been taken. Congress has provided many statutory tools needed to cope with ground water problems at the national level. RCRA, CERCLA, and the Safe Drinking Water Act, along with several other Federal environmental statutes and programs, do define an existing Federal framework for policy and action relating to ground water protection.

At the same time, State and local governments have been dealing with local ground water issues, implementing these federally-mandated programs, and developing their own ground water management and protection programs. We see no lack of attention to ground water issues at the State and local level.

States recognize their fundamental responsibility for protecting and managing their ground water resources. CMA similarly believes primary responsibility for ground water management should reside with the States.

From this starting point, the Congress needs to consider two broad questions in deciding what additional steps to take. First, what do individual States need from the Federal Government to support their own ground water programs? Second, what, if anything, should the Congress encourage States to do to see that ground water resources are protected at the national level?

With respect to individual State needs, there are tools that the Federal Government can and should provide. Some of these include criteria that will help the States set ground water standards, technical and informational assistance in areas such as resource characterization, aquifer mapping, site investigations, research into better technologies for ground water investigations and clean-up efforts, and better coordination among Federal agencies.

These needs are addressed in the research bills before the committee. CMA believes the House bill, H.R. 791, takes the better approach. This bill, we believe, responds to identified State needs. It authorizes State support from Federal agencies where specific statutory authority does not now exist, and it will improve both the coordination and the dissemination of Federal expertise to State agencies.

Although S. 1105 addresses similar issues, we see it as focusing more on supporting development of future Federal regulatory programs rather than focusing on State needs. In addition, we see a particular problem with the provision in S. 1105 which establishes a new approach for EPA to conduct research itself on contaminants and require manufacturers to pay for the cost of the research. We believe the structure currently existing under Tosca is a better approach for conducting any needed testing.

Let me turn to the second question. Consider that second question—that is, whether additional steps are needed to encourage State action—by reviewing the collective State authorities and programs that currently exist or are being developed by the States. We also suggest soliciting from the governor of each State information on their needs and on their views on key policy issues. Our own view is that the States are moving forward. However, we really don't see ourselves or anyone else answering this question for the States.

We do have some further suggestions to continue the momentum the House has established on groundwater issues in this Congress. If the committee determines, based on a review of State programs and needs, that additional steps are appropriate, we do recommend the committee identify those steps for which a broad consensus could readily be reached. Those steps could include State groundwater resource characterization and monitoring programs and State groundwater management strategies. These are logical elements for any State program.

The resource characterization would provide the foundation for establishing management strategies based upon State priority needs while recognizing the State's responsibility to determine its own policy approach. State monitoring programs would provide the foundation for characterizing groundwater resources and enhance ongoing compliance and resource management activities. Those States that have existing programs should not have new requirements imposed upon them. In discussing these issues, I mention we look at the provisions in S. 20 dealing with these areas as perhaps a useful starting point for developing these types of additional steps, should the committee decide that additional steps are necessary.

Taken together with H.R. 791 and with limited Federal financial assistance, this approach could enable the Congress to meet its responsibilities in a constructive and cooperative fashion. It would encourage States to move forward in carrying out their responsibilities to protect and manage their ground water resources.

Thank you, Mr. Chairman.

Senator MOYNIHAN. Thank you, Mr. Cunningham, for very clear and thoughtful testimony.

Mr. Egler, do you want to add anything?

Mr. EGLER. No, sir.

Senator MOYNIHAN. You're just here as a hydrologist to see if he made some awful mistake?

Mr. CUNNINGHAM. That's about right, Mr. Chairman.

Senator **Moynihan**. Mr. Giese, good morning. We welcome you from the Fertilizer Institute.

Senator **Durenberger**. Mr. Chairman, if I might——

Senator **Moynihan**. Yes, of course.

Senator **Durenberger**. Mr. Giese is from Minnesota by way of Iowa. He made the mistake of being born in Iowa and recognized that after he reached adulthood and came to Minnesota.

Senator **Moynihan**. For the winter weather.

Senator **Durenberger**. Well, it's just like this in Minnesota all year around, Mr. Chairman.

This is why for 17 years Land O'Lakes has been making such a contribution to my State, and Mr. Giese has been such a big help to a lot of us. He's a new member of the board of the Fertilizer Institute and has been very helpful, although we haven't always agreed on everything.

He does bring a very bright, fresh approach to the subject. I welcome him today and recommend his testimony, most of his testimony, to all of my colleagues.

Senator **Moynihan**. There you are, sir.

STATEMENT OF AL GIESE, VICE PRESIDENT, AGRONOMY DIVISION, CENEX/LAND O'LAKES, ON BEHALF OF THE FERTILIZER INSTITUTE

Mr. **Giese**. Thank you very much for those kind remarks.

It is certainly a pleasure and an honor to be here today testifying before you on this subject. I am vice president of the Agronomy Division for Cenex/Land O'Lakes, but I am testifying today on behalf of the Fertilizer Institute and their member companies. Currently I serve as chairman of the institute's water quality work group and vice chairman of the board of directors.

Rather than read from my written testimony, I would like to augment my statement by briefly——

Senator **Moynihan**. It will be made part of the record routinely. So you go right ahead.

Mr. **Giese**. Yes, sir, thank you.

I will briefly review several basic questions we face in agriculture regarding the impact on ground water quality. First, what do we know about agricultural practices and their effect on ground water quality? We know we are dependent on a limited plant root system to capture and utilize the available nutrients in the soil. At best, we only recover 50 to 70 percent of the available nitrogen in the soil. Nature's system is not leak-proof. Nitrogen in the soil is mobile and will be present in varying degrees in nature's universal solvent, water.

We know that nature does not supply the total need for nitrogen and we need commercial fertilizer to supplement nutrients available for efficient crop production. We know that all nitrate in groundwater does not come from fertilizer application, but that we do have hot spots throughout the farm belt where research has shown that applied nitrogen can be traced into the ground water because of the specific situation in a given area.

Second, there is a lot of information still unknown that concerns us a great deal. A tremendous amount of research that has been completed to efficiently increase crop yields must now be reviewed as we attempt to mitigate ground water impact. We are pleased to see that USDA is moving quickly in this area and have attached ARS's strategic ground water plan for nitrates in our written testimony.

They are well along in reviewing agricultural practices to improve our knowledge of ground water impact. Our concern is that the politics of ground water regulation does not get beyond those facts. If this happened, agriculture would be in deep trouble and farmers' ability to farm in an efficient and economic manner would be seriously jeopardized.

Third, agriculture is looking for the best management practices (BMPs) that will prevent or mitigate ground water contamination. We were pleased that the House included the Nitrogen Best Management Practices Act in H.R. 791. The act would require USDA, EPA, and others to further develop BMP's and to disseminate them to farmers.

Also, 22 Senators have endorsed this concept in the Senate by cosponsoring S. 1767, a similar bill.

Agriculture needs information more than it needs regulation. We all want clean water and a safe environment.

I'm going to talk for a minute about what the company I am employed by is doing to improve the efficiency, economics, and environmental safety of crop production. The Agronomy Division of Cenex/Land O'Lakes, which I manage, is a leading marketer of fertilizer through member cooperative retail dealers who provide agronomic products and services to farmer members in 15 Midwestern and Pacific Northwestern States. Cenex/Land O'Lakes is an agricultural cooperative owned and controlled by the farmers served in those 15 States. We are based in the twin cities of Minneapolis-St. Paul.

We have a long-established history of offering agronomic programs and maintaining a strong commitment to research programs that provide the proper training and technical knowledge to our dealers and their farmer customers to insure that all agronomic products marketed by our company are used efficiently, economically, and in an environmentally safe manner from both the human and environmental standpoint.

The leading technical programs are called central and cropland, which positions our dealers and their farmer customers with professionally-trained agronomists to assist farmers in the best crop production decisions possible. The agronomist is supported with the latest technical information, research, computer systems, regulatory requirements, and ongoing training to insure that the products we market are used safely and judiciously.

We maintain a fully staffed department of trained professionals to constantly stay abreast of the new developments in agronomics, to facilitate research and provide ongoing training and expertise to agronomists, dealers, and farmers in our market.

We also operate a professional soils laboratory providing analyses and other laboratory requirements necessary for growing crops safely and efficiently. We have recently repositioned that business to remove ourselves, voluntarily remove ourselves, from the dual role of doing soil analysis and selling fertilizer. We have positioned that business with an independent soils laboratory and added to the soil analysis what we call a second opinion, much like a second opinion that you would receive in the medical arena.

We have our own recommendations package based on soil analysis. We are now putting the State universities' recommendations based on that analysis right on the report form so that the farmer knows what his State university is recommending versus what we would recommend.

My company is voluntarily financing the computer programming at the State university to accomplish this endeavor.

In addition, we conduct extensive research at our major research farm in Iowa and at our research stations in the Pacific Northwest and at individual farmsites across our market area. We currently have over 300 professionally trained agronomists representing our system in the 15 States that we market in, and we are expanding that number rapidly.

Cenex/Land O'Lakes has also pioneered new technology in field application equipment that combines computer technology, infrared photography, laboratory analysis, and sophisticated crop management data by individual farmer's field to insure absolute accuracy of product application as soil conditions change within that individual field. This patented technology is currently being introduced into the market and it was developed at a capital cost in excess of several million dollars and represents our dedication to insuring that we use the proper products in the proper quantities in production agriculture.

Another concept that we are currently introducing into the market this year is a computer networking system that will link the majority of our 1500 dealers in 15 States to the agronomic information providers throughout North America. This system will provide our dealers and agronomists in the field with direct access to all product, crop management, technical, and regulatory information currently available from all pertinent sources updated every 24 hours.

This is being done again at a cost to my company of several million dollars. It is being done to insure that the agronomic products we market are used judiciously and properly and legally.

These efforts and similar actions throughout agriculture were not mandated by regulations. They have been an integral part of the way we have done business for years. We understand very clearly, particularly as an agricultural cooperative, that it's of little benefit to us to promote the unnecessary use of products in production agriculture. To do so brings economic harm to the farmer and ultimately to the companies who are serving him.

Thank you.

Senator **MOYNIHAN**. We thank you, Mr. Giese, for a very clear testimony. We thank you particularly for the very nice bit of chemical analyses in your paper itself. It is very helpful at least to this Senator. I want to acknowledge the appreciation.

It's sort of discouraging, that number of yours, for the organic farmers of the world to learn that it will require 26 tons of manure per acre to achieve the average crop production from 132 pounds of commercial nitrogen. It just won't quite work, will it?

We welcome Senator Symms and, of course, Senator Breaux.

OPENING STATEMENT OF HON. STEVE SYMMS, U.S. SENATOR FROM THE STATE OF IDAHO

Senator **Symms**. Thank you very much, Mr. Chairman. I have an opening statement and coupled with that, I would like to ask unanimous consent that the Western Regional Council's position paper on ground water be inserted in the record with my statement.

Mr. Chairman, Idaho ranks high on the list of States that pump water from the ground. It's very interesting what the U.S. Geological Survey has said about the general characteristics of water in Idaho. The quality of the water is generally suitable for all uses, and it meets the national drinking water standards. We feel very strongly that we're on the right track in our State, handling it ourselves. If the Federal Government is going to get involved in it, what we would want is technical assistance, information, money, whatever else you might have, but we don't need to have an EPA regulator at the wellhead of every well in Idaho or at the waste ditch.

I think that the Western Regional Council really speaks to that also, Mr. Chairman, and I would appreciate having that in the record.

I want to thank all of the witnesses that are here today. I've have three other committee meetings this morning so I may not be here for the entire hearing, but I'm very interested in the subject and I will follow very carefully what you have all had to say.

[Senator Symm's statement and attachment follow:]

Opening Statement of Hon. Steve Symms, U.S. Senator From the State of Idaho

Mr. Chairman: Idaho ranks in the top five ground water-using States in the Nation, pumping over 6.3 billion gallons of ground water every day. Therefore, the topic of these hearings has been of great interest to me.

According to a February 5, U.S. Geological Survey report, "the chemical characteristics and suitability for use of Idaho's ground water differ throughout the State. Its chemical quality is generally suitable for most uses and meets national drinking water standards."

It interests me that the USGS notes how gound water characteristics differ even within a single state like Idaho. The differences are even greater throughout the Nation. The heavily ground water-dependent western States, in particular, face ground water conditions dramatically different from those in the mid-west and eastern portions of the country. At this time, Mr. Chairman. I request that the position statement on ground water of the Western Regional Council be added into the hearing record.

Western Regional Council Position Statement on Ground Water

The Western Regional Council recognizes that the management and protection of our Nation's ground water is important. The WRC, however, does not believe legislation creating a comprehensive Federal ground water regulatory program is necessary or appropriate.

The basic responsibility and authority for ground water management should remain with the States. In the West, water has long been managed as a critical, scarce, and carefully allocated resource, and States have water management laws already in place. These laws address both surface and ground water quantity and quality. Because of increasing water demand for development and quality drinking water, western States have been active and innovative by expanding and implementing ground water management programs.

Such factors as geography, climate, demographics, geology, hydrology and water rights separate the West from other regions of the country. States can better establish regulations taking into consideration the unique aspects of each state. Interstate conflicts are best addressed through interstate compacts.

Should the Congress consider ground water legislation, the Federal role defined by such legislation should be limited to funding, techincal assistance and authority for state management of Indian and Federal lands and facilities. The Congress should not attempt to impose artificial uniformity by establishing national standards and mandatory aquifer classification systems.

Senator MOYNIHAN. Thank you.

Senator Breaux?

Senator BREAUX. No comments right now.

Senator MOYNIHAN. I'd like to ask just a general question of the panel. Each of you might respond in turn. The degree that we have a ground water problem in our country, it is associated very much with chemical fertilizers. There are urban concentrations such as Long Island off New York where there's just a great many people on a single aquifer, but typically it is fertilizer.

Could I just go down, start with Dr. Clark—we are not going to be using less fertilizer in our agriculture; we're going to be using more, aren't we, although the appearance of alfalfa and soybeans has made a big difference in the way nitrogen is collected in the soil, at least to my knowledge.

What is your judgment on this chemical environment that came upon us?

Mr. CLARK. Mr. Chairman, first of all, I'm not sure that I agree with your premise that fertilizer is the major cause of contamination.

Senator MOYNIHAN. Oh, really? Okay.

Mr. CLARK. Let's accept that fertilizer is certainly one of the causes. I think that nitrate fertilizer clearly presents one of the most difficult issues for ground water protection and for agriculture in general, because, as we are trying to keep it from flowing off the surface to control nonpoint pollution of our surface waters, more of it is going to go into the ground.

The answer to nitrate fertilizer is better fertilizer management. You can use less fertilizer if you place it properly both in location and in time. Ultimately, I think this country is going to be moving more toward what is called low-input agriculture, or, in the extreme, organic agriculture. I think we are going to need to do that, and I think that better input management like that is the only answer.

Senator MOYNIHAN. A very thoughtful response.

Ms. Smith?

Ms. SMITH. Thank you, Mr. Chairman.

I guess I would agree with Dr. Clark that that is one of many sources of ground water contamination, and I think I basically agree that in terms of coming up with solutions we need to be moving toward low input or what we call sustainable agriculture. In fact, USDA announced just recently the availability of $3.9 million. It's a small amount, but at least an amount that will go to low-input farming demonstration projects in several States. I think that that's an important step toward trying to reduce the amount of chemical fertilizer needs as well as the amount of chemical pesticide needs used by agriculture.

Senator MOYNIHAN. Oh, of course, I believe in pesticides.

Ms. SMITH. I think also the other thing is that—the other positive aspect is that the House Agriculture Committee has been having a series of hearings on ground water focusing not necessarily on the FIFRA regulatory debate, but on how farm policy may, in fact, impact groundwater problems and whether, in looking toward the next farm bill, we may need to look toward adjusting farm policy and commodity programs so that farmers can make wiser choices both economically and environmentally.

I think that Senator Nunn actually has written a paper—and I can't recall which journal it was in—calling for some effort in the next farm bill to do exactly that.

I think basically the important thing is whether it be fertilizer, whether it be pesticides, whatever, we need to move on with trying to figure out what the solutions will be so that we don't end up putting contaminants in ground water. I think that S. 1105, in terms of a research agenda, is the right step to do that. It looks not only toward characterizing the ground water problem, as does H.R. 791, and that's important, but S. 1105 also takes the step of looking toward what the solutions are and promoting and developing solutions to contamination.

Senator MOYNIHAN. Mr. Cunningham, the normal supply of nitrogen is that which is brought down with rainwater; isn't that the agricultural cycle of nature?

Mr. CUNNINGHAM. Let me suggest, Mr. Chairman, I think the question from the CMA perspective is better handled by the Fertilizer Institute. Many of the companies are the same, but I would suggest Mr. Giese.

Senator MOYNIHAN. Sure. Mr. Giese, your subject?

Mr. GIESE. Mr. Chairman, we certainly support the concept of using as minimum amount of inputs in production agriculture including commercial fertilizers as the farmer can judiciously use to produce at maximum efficiency.

There are three basic plant nutrients required by the plant itself——

Senator MOYNIHAN. N, P, K.

Mr. GIESE [continuing]. N, P, and K; right. P and K are not mobile in the soil itself and present very little environmental problem. Nitrogen is the problem area because we are dealing with nitrates in the ground water, one of which can be contributed by nitrogen fertilizer applied to the soil. On the other hand, we have naturally-occurring nitrogen in the soil as well.

We have strived as an industry for the last decade to continue to research and find ways to minimize the amount of inputs and have found ways. If you look at the data available, crop yields have continued to increase while fertilizer rates have not increased.

Senator MOYNIHAN. Is that right?

Mr. GIESE. Yes, sir.

Senator MOYNIHAN. You can track that, can you?

Mr. GIESE. Yes, sir. The biggest nitrogen users are corn and soybeans in the farm belt—or corn and wheat.

Senator MOYNIHAN. Soybeans produce nitrogen.

Mr. GIESE. Soybeans produce nitrogen. Alfalfa produces nitrogen.

Senator MOYNIHAN. Yes.

Mr. GIESE. Corn and wheat require nitrogen. Farmers continue to get more efficient while lowering their inputs, and that's from technology delivered by the marketers of these products.

Senator MOYNIHAN. I don't doubt it and I appreciate hearing it. We appreciate all this testimony. We're getting close to some decisions on this panel and you've helped us a very great deal. We thank you all.

Our second panel of the morning, which continues in very much the same pattern of the previous one, we're going to have Mr. Erik Olson, who is counsel to the National Wildlife Federation, who will be accompanied by Dr. Gerald Poje, who is a toxicologist. Mr. Bruce Leavitt is appearing on behalf of the American Mining Congress; Mr. Roger Strelow of the National Environmental Development Association; and Mr. Jay Lehr, who is director of the National Water Well Association.

As is our pattern, we will follow the order in which the names appear. Mr. Olson, we welcome you on behalf of the National Wildlife Federation.

STATEMENT OF ERIK OLSON, COUNSEL, ENVIRONMENTAL QUALITY DIVISION, NATIONAL WILDLIFE FEDERATION, ACCOMPANIED BY GERALD V. POJE, TOXICOLOGIST

Mr. OLSON. Thank you, Mr. Chairman. I'm Erik Olson. I'm counsel, as you said, for the Environmental Quality Division of the National Wildlife Federation. This is Dr. Jerry Poje who is our environmental toxicologist.

I'll be condensing the first 10 pages of the testimony which are intended to be an overview of the more lengthy statement.

The National Wildlife Federation is the largest citizen conservation organization in the country with 5 million members and supporters. We thank the subcommittees for inviting us to testify.

We commend Senators Durenberger, Baucus, Chafee, and Stafford for introducing S. 2091 and 2092, which we believe is the best comprehensive national ground water protection legislation introduced to date. While we believe that the legislation still has rough spots and gaps, S. 2091 and 2092 should be used as the vehicle for moving the debate forward on ground water protection.

We also commend the sponsors, including the chairman, of S. 20, an earlier bill introduced to get the debate moving. We agree that each of the elements of a State ground water protection program required in S. 20 is important and is needed. We conclude, however, that S. 20 has too vague and skeletal a description of the necessary components of a State program. As drafted, we believe the bill cannot assure the rigorous and meaningful review of the State programs that's necessary.

The bill also has no provision to require sluggish States to move forward with protecting ground water and includes provisions that inadvertently would weaken existing law, including RCRA and Superfund.

Since S. 20 has now served its purpose to get the debate moving, we urge that S. 2091 and 2092 now be used to focus Congress 'attention on the specifics of ground water protection legislation.

In addition, we support S. 1105, the ground water research legislation before the committee. We urge the committee, however, to recognize that while further research is needed, multi-year research programs must not be used as an excuse to avoid comprehensive ground water protection legislation.

Finally, we urge the committee to support and work for swift enactment of S. 1419 which would address the problem of pesticides in ground water.

On page 4 of the testimony I have quoted from some testimony given over 20 years ago before the Senate Public Works Committee. It was given by opponents to Federal clean air legislation arguing that clean air is essentially a local concern. With the leadership of Senator Muskie and others, Congress rejected those arguments and protected the American public from air pollution by enacting comprehensive Federal clean air legislation, the Clean Air Act.

Today we hear the same time-worn arguments in the ground water context. We are told that somehow ground water is a uniquely local problem, that we should not burden industry or States with a premature new Federal law that tells them to protect the Nation's ground water systems, and that the status quo is fine. Today, we should know better.

Ground water pollution is a public health and environmental problem of the first magnitude. Ground water provides about half of the Nation's population with its drinking water and over 95 percent of rural Americans with their drinking water. Yet, it is polluted across the Nation by a variety of chemicals and pathogens.

EPA found that from 1971 to 1985 over 52,000 people had become ill in outbreaks of disease and poisoning due to drinking contaminated ground water. EPA says that, due to underreporting, the actual number may be 25 times larger.

The number of chronic illnesses and latent diseases such as cancer has yet to be determined, but we do know that ground water in every State is polluted by a cornucopia of organic and inorganic pollutants. Dr. Poje, who is with me, is an expert on some of those contaminants, and would be happy to answer any questions about them.

Some of these chemicals are suspected of causing an array of health problems ranging from birth defects to reproductive failure and suppression of the immune system or cancer. Tragically, South Dakota officials have reported that high levels of nitrates in ground water used for baby formula killed an infant in that State.

Ground water pollution problems also can become surface water pollution problems. This is because nearly a third of the flow of the Nation's surface water comes from ground water. Sensitive aquatic ecosystems in surface wetlands and streams, therefore, can be harmed by ground water pollution.

Each year the Federal Government and private parties spend billions of dollars cleaning up our past mistakes under RCRA and under Superfund. Of course, these waste site cleanups are very important, but we're spending little on preventing exactly the same problems from recurring in the future. In our view, as a Nation we're penny wise and pound foolish.

This is highlighted by the administration's fiscal year 1989 budget. While EPA asks again for substantial money for cleanup, no money is requested to pay for two very modest ground water protection programs Congress adopted in the 1986 Safe Drinking Water Act amendments. We believe we must now embark on what undoubtedly will be one of the key environmental issues of the 1990's and beyond, preventing ground water contamination.

We must ask, will our children and grandchildren look back to the late 1980's and say we had a chance then to prevent the devastation of the Nation's ground water—over 90 percent of our fresh water—but we lacked the vision and the courage to save these precious resources?

Many of the greatest leaders in the struggle to protect public health and the environment have come from the ranks of this committee. The Nation again needs this committee's leadership today to avoid a crisis and to prevent a national tragedy while it's still preventable.

We must reject the notion in our view that our generation can assign large basins of ground water for continued pollution to lie as buried monuments to our lack of vision and greed. As Senators Durenberger, Baucus, Chafee, and Stafford have recognized in introducing S. 2091 and 2092, action is needed and the time to act is now.

Thank you.

Senator MOYNIHAN. We thank you, Mr. Olson, for a very passioned view of these matters.

Mr. Bruce Leavitt on behalf of the American Mining Congress. Mr. Leavitt, we welcome you.

STATEMENT OF BRUCE R. LEAVITT, HYDROGEOLOGIST, CONSOLIDATION COAL CO., ON BEHALF OF THE AMERICAN MINING CONGRESS

Mr. LEAVITT. Thank you, Senator Moynihan.

I'm a hydrogeologist with the environmental quality control department of Consolidation Coal Company. I'm also the chairman of the American Mining Congress ground water task group.

Included with our testimony today as attachments are AMC's comments on the Senate ground water bills, responses of the American Mining Congress to the Senate Environment and Public Works Committee ground water questionnaire. I also have three white papers.

Senator MOYNIHAN. Yes, we see them.

Mr. LEAVITT. These are entitled, "Mining & Ground water," "Ground water Management, Federal & State Roles," and "Ground water Management, Nondegradation Versus Management for Multiple use." In addition, we have included a legal memorandum dated October 14, 1987 regarding Federal versus State regulation of ground water quality. I request that these be included with my statement.

Senator MOYNIHAN. They will be retained in the files of this hearing.

Mr. LEAVITT. Thank you.

The American Mining Congress believes the judicious ground water protection is vital to the health of our citizens and our economy. Mining and ground water are inextricably intertwined. In order to remove minerals from the earth, it is necessary to excavate them from within, above, and below aquifers. This unique view of the ground water resource—and I might point out that we are among the few who actually see ground water—has led AMC to develop a realistic approach to ground water protection.

The mining industry believes that the most prudent course of action is to manage the vital resource for the maximum benefit of society. Proper management requires both the knowledge of the resource and the needs of society, now and in the future.

The very act of mining changes the ground water system around the mine. The most obvious effect is that ground water flows into the mine. This causes changes in the level of ground water in the aquifer. Mining also breaks up the rocks that contain the minerals. Fresh rock surfaces are exposed to any weathering process. Ground water passing over this broken rock can dissolve certain components of the rock as well as any weathering products. This causes changes in the natural water chemistry. Because mining occurs in areas where ore minerals are abundant, it is not unusual to find elevated concentrations of some minerals in the naturally-occurring ground water and mine water.

These consequences of mining are unavoidable. We cannot prevent ground water from entering the mine, nor can we prevent the dissolution of soluble components of the rock. This may limit the use of ground water in and around the mine. Clearly, we must minimize our impacts to ground water, but just as clearly this Nation cannot exist as we know it without mining.

Mining is not the only activity of our society that has an unavoidable impact on ground water. Septic tanks represent the single largest contribution of contaminants to ground water. The use of fertilizer has caused ground water contamination in a number of States while providing food supplies and other important agricultural commodities. Highway deicing compounds find their way into ground water after they have reduced hazardous conditions on our Nation's highways. Other beneficial activities such as construction and forestry also have been documented as contributing to ground water contamination.

The similarity of all these activities, including mining, is that they provide significant benefits to society and they cannot be conducted without some impact on ground water. If our purpose is to restrict ground water only for drinking, then we may effectively prohibit these other beneficial activities.

Attached to this testimony is a paper entitled, "Mining & Ground water," which amplifies the relationship between society, mining, and ground water.

Some people believe that ground water can be protected without knowledge of the hydrogeology. This belief is in error. To illustrate this point, I have brought a ground water vulnerability map of Madison County, Ohio, which was prepared by the State of Ohio. This map portrays the relative potential for a contaminant introduced at the surface of the ground to effect the quality of the ground water below. The map has been prepared from existing data using the "DRASTIC" methodology developed by the National Water Well Association under contract to the Environmental Protection Agency.

Glacial geology is a major factor in Madison County. Consequently, this map should be of special interest to Members who represent States that have been glaciated, particularly New York and Minnesota, since they seem to have an interest in this committee.

You will notice that the map has been divided into seven different colored areas. Each color represents a different level of ground water vulnerability. The orange areas are the most vulnerable to contamination and the purple areas are the least vulnerable. Sole reliance on source controls would mean that a new sanitary landfill, for example, could be located anywhere in Madison County without regard to the hydrogeology. However, with the use of a ground water vulnerability map, it becomes clear that some geologic settings are far better able than others to protect ground water and, hence, would be better locations for siting a sanitary landfill.

In addition to aiding resource managers, these maps are also useful to industries that may be choosing a location for a new facility. Because of the liabilities that arise out of RCRA and SARA, it is advantageous for industry to locate at a site that minimizes its exposure.

Ground water vulnerability maps cannot substitute for detailed site investigations, but they can encourage development in areas of lower risk.

Unlike the siting of sanitary landfills, mining does not have the luxury of locating in the most advantageous site for ground water protection. Mines must be located where the resource exists. Consequently, choices must be made about the use of competing resources.

For example, glacial activity left behind out-wash channels that contain sand and gravel. These channels can be seen on the vulnerability map in orange and yellow. Sand and gravel is utilized in large quantities in the construction of homes, buildings, and roads, and it also forms some of our most productive aquifers.

Three gravel pits exist in Madison County. The extraction of sand and gravel not only affects the quantity of ground water present, but can also impact the ground water quality and the aquifer's future vulnerability. In fact, the mining of sand and gravel constitutes the removal of part of the aquifer.

Society's need for aggregate is in conflict with society's desire to protect ground water. This conflict calls for an informed resource management decision which considers the importance of the aggregate to society, the impacts of mining it on the ground water, and society's need for that ground water.

These decisions cannot and should not be made in Washington. At the State level the control of ground water quantity and quality meet and the ability and flexibility to manage the resource become focused. Consideration must be given to such factors as drinking water needs, water rights, hydrogeology, past and future land use, and economic development.

Some believe that States are not acting to protect this resource. I mentioned previously that this map was prepared by the State of Ohio. Ohio is undertaking the preparation of ground water vulnerability maps on a county-by-county basis for the entire State.

Some of the work will be done internally and some of the mapping will be done by contract ground water consultants in an effort to speed the process. Other States are undertaking similar programs. At this time, AMC is aware of activity in Virginia, Florida, Arizona, Idaho, Washington, Nebraska, Kansas, and Georgia. While this list is not exhaustive, it indicates that the States are willing and able to undertake detailed analysis of their resources in an effort to protect ground water.

Ground water vulnerability mapping is only one example of active State efforts to protect ground water. Other areas of State activity include the development of protection strategies, the enactment of legislation where necessary, and the establishment of ground water quality standards.

Public education is a major factor in effective ground water protection. Indiscriminate disposal by individuals of waste or unused products can cause contamination. Federal regulation cannot cope with ground water contamination at this level. Therefore, AMC supports broadbased public education about ground water. These programs should be developed by the States and nonprofit organizations.

Nondegradation has been proposed as a means of achieving ground water protection. This concept is unworkable, as we have discussed. It is impossible to conduct many essential human activities without adding contaminants to ground water.

Even the proponents of nondegradation admit that it is unachievable. Use of the term creates confusion and misunderstanding. Simply redefining nondegradation to mean something else does not protect ground water. One has to question if this approach is being honest with the American people.

Rather than redefining terms, it is better to recognize the technical realities and manage the resource to accommodate competing beneficial uses. A thorough discussion of this subject is included along with our testimony.

In conclusion, the American Mining Congress supports the management of ground water resources for all of society's needs now and in the future. Simplistic concepts such as nondegradation and inflexible regulations obscure the real work that needs to be done. Because of the diversity of the resource and its utilization, the most appropriate role for the Federal Government is to provide technical and financial support to the States and allow maximum flexibility in how the States choose to protect their ground water.

Thank you.

Senator MOYNIHAN. Thank you, Mr. Leavitt. That's nice timing because we have a vote on the floor and I am going to have to ask the committee to stand in recess while I go to vote and then I will return in about 10 minutes round trip.

Thank you particularly for including your little newsletter on environmental issues called, "Insights." It's full of absorbing bits——

Mr. LEAVITT. Thank you, Senator. We hope to have a fourth one out within the next month or two.

Senator MOYNIHAN. Well, put us on your mailing list.

We stand in recess until the call of the Chair, which will be only until I return.

[Brief recess taken.]

Senator MOYNIHAN. Once again, good morning to all our guests.

I don't regret our interlude. We are here to vote. When votes are called, we have to appear.

We just finished Mr. Leavitt's interesting testimony on behalf of the American Mining Congress, and now Mr. Roger Strelow of the National Environmental Development Association will be our witness. Mr. Strelow, we welcome you, sir.

STATEMENT OF ROGER STRELOW, VICE PRESIDENT FOR ENVIRONMENTAL PROGRAMS, GENERAL ELECTRIC, ON BEHALF OF THE NATIONAL ENVIRONMENTAL DEVELOPMENT ASSOCIATION

Mr. **Strelow**. Mr. Chairman, we appreciate this opportunity to testify today on three bills which reflect the growing consensus that the Nation does need a new and more effective commitment to protect our ground water resources.

I'm vice president of General Electric for environmental programs and also appearing today as chairman of the NEDA ground water project. As you know, Mr. Chairman, GE has a major presence throughout New York State. It is a big part of the State's economy. I'm proud to take note of the fact in this context that GE was the first major company to achieve and then implement a comprehensive ground water cleanup program with New York State in its seven sites agreement.

Senator **Moynihan**. Right. You were also the first major company to dump PCB's into the Hudson River.

Mr. **Strelow**. Yes, and we've been cleaning that up ever since. We've got ongoing efforts on that front and others.

NEDA is a coalition of industrial, agricultural, and labor interests and includes members from the electronics, food, chemicals, mining, construction, and petroleum refining and processing sectors.

In view of the widely varying nature of ground water resources, NEDA, as early as 1985, made the point that has been echoed today by Mr. Clark on behalf of the Conservation Foundation of the need for what we call a new Federal-State partnership, not by any means an abdication of Federal responsibility, but a recognition that in what remains to be done with ground water protection, the States need to play a particularly prominent role.

I would note that the National Research Council, an objective, scientific organization, and the Environmental and Energy Study Institute have joined the Conservation Foundation and ourselves in making this basic point. I think to understand that in context it's important to point out that RCRA, CERCLA, and the Safe Drinking Water Act are all established ground water protection programs. It's not as if the Federal Government hasn't been and isn't doing a lot in this area.

With these major Federal regulatory and enforcement programs already in place, we believe that the two additional ingredients that are needed to really form this new Federal-State partnership are twofold: one, expanded Federal assistance to the States, technical and scientific support as well as financial, so that they can focus even better on some of the source categories that remain to be controlled, and, secondly, improved State regulatory programs tailored to meet the conditions and needs of each particular State.

Contrary to the characterization that Mr. Olson gave a little while ago, that is certainly not a status quo position. We feel that the State programs need to be improved and upgraded significantly.

Turning to the bills before the subcommittee today, we strongly support H.R. 791, which would effectively address the need for improved Federal information and assistance to the States. S. 20, your own bill, Mr. Chairman, we view as a very positive step toward recognizing the State primacy and flexibility that we believe are necessary with regard to regulatory programs. We would like to suggest a few improvements and clarifications, but we're basically positive with regard to that bill.

S. 1105 in our view is fundamentally flawed because it has an unjustified and unbridled authorization in what purports to be a research bill for a major toxicological testing program that would be put on the backs of private industry.

H.R. 791, to address the first of these, seems well designed to meet the States' needs and to balance the Federal and State roles in ground water protection. It's a carefully crafted bill that identifies the various types of research and information that State ground water regulatory agencies need and it seeks to insure that Federal agencies that have the appropriate expertise—and there are several of them—work in a coordinated way to supply it.

I have attached to my statement a letter of support for this bill that we sent to the House last year which can be included in the record.

Turning to S. 20, this bill has many positive features that we commend. It recognizes the need for greater State primacy and flexibility than has been the case in the Federal-State environmental regulatory program fashioned in the 1970's, and there may be good reasons for those differences.

S. 20 recognizes the multiple uses of ground water and the fact that not all ground waters can or should be designated for the same uses or subjected to uniform standards. This is particularly notable in the case of ground water that may be heavily contaminated naturally, that's very briny and has other natural contamination that simply prevents it from being realistically considered, for example, for drinking water purposes.

Your bill calls for appropriate Federal technical guidance in providing criteria for State standard setting and it recognizes the need for Federal financial assistance to help the States build and improve their programs. As I said, we do have some suggested improvements and clarifications that we would be glad to dicuss in more detail with your staff later, but I might just note what these are. Two of them relate to the standards-setting process.

One is to insure that the standards are focused on the point of use where the ground water actually has an environmental impact or is withdrawn for human consumption to make the standard-setting and enforcement process realistic and effective.

Second is a need, we believe, not to establish a presumption in favor of a drinking water classification. Your bill says the standards to be set will all be drinking water standards unless the State chooses otherwise. It may be only a matter of emphasis, but, from a political standpoint, with that kind of a presumption, States that might otherwise recognize that certain naturally heavily contaminated waters simply ought not to be realistically held out to the public as possible future sources of ground water may feel constrained against setting other protective standards that are more appropriate for that water body. So we would simply urge a slight realignment of that part of the standards-setting provision.

The bill does have provisions to allow individual States to waive out of certain generally-required ground water program elements where a particular one simply isn't needed in that jurisdiction. It says the State must demonstrate that there is not a need for a particular element.

We believe this is basically a very good feature, partly because of my next point, which is the inevitable limitation on funding. Particularly in the this era of Federal budget deficits and the need to limit additional spending, it's going to be important that the States, with the limited funding that they will get from these or other bills, be enabled to really focus on the problems that are high priority.

Unfortunately, under other Federal-State programs that EPA administers there has been a long history of a checklist approach. The Federal Government decides a whole bunch of things that everybody should do without any tolerance for variation, and the States are simply held to that, even though there is supposed to be flexibility.

We think your bill moves in the right direction here and we simply suggest that you perhaps clarify even more that EPA is to acknowledge this inevitable variability.

Turning to S. 1105, this bill, which has been added to S. 20, we believe should be removed from it. H.R. 791 from the House, we believe, would be a much more appropriate and effective substitute for the important research, data gathering, and data dissemination activities that S. 1105 does address in part.

The most significant problem with S. 1105 is the provision in section 104 of that bill which would impose a massive new regulatory program that would supersede another very well-established and useful regulatory program in another statute with no justification that we can see.

Senator MOYNIHAN. Section 104?

Mr. STRELOW. Section 104 would require EPA on the initiative of the director of the National Toxicology Program to order chemical manufacturers and importers to undertake potentially very costly toxicological testing of a wide variety of chemicals that they make simply because the chemicals are "known to occur in ground waters" or "have the potential to leach into ground waters."

Now in section 4 of the Toxic Substance Control Act, enacted over a decade ago, EPA has very broad authority to require manufacturers to test their chemicals but with an important pre-condition and qualification which I think is certainly reasonable: if some risk to the public, is either known or anticipated—it doesn't have to be demonstrated, but if it's reasonably anticipated—EPA can require manufacturers to test.

This new provision in S. 1105 has no such threshold requirement. There is no requirement that any known or anticipated risk to the public be shown or that the testing would facilitate either remedial or preventative programs relating to ground water.

For that reason, since we believe EPA and the relatively new Agency for Toxic Substance and Disease Registry already have ample authority to get industry to do testing where it's appropriate and there is a basis for it, we simply have to oppose these unbridled provisions in S. 1105.

My remarks have been made in an attempt to provide constructive assistance to the subcommittees. NEDA would be pleased to provide any further information or suggestions that may help the subcommittees determine what legislative or other steps might best advance the new Federal-State partnership that is needed to complement existing ground water protection laws.

We have a response to the committee's very thoughtful questionnaire on a number of these issues that will be submitted for the record. Thank you.

Senator MOYNIHAN. Thank you, sir, for a very energetic, very straightforward, very positive statement. Are you an engineer?

Mr. STRELOW. No, I'm a lawyer, I'll admit.

Senator MOYNIHAN. You sound to me like an engineer. It was very refreshing.

Mr. STRELOW. I can't wait to tell that to my engineering colleagues back at the company.

Senator MOYNIHAN. There are dilemmas in this business. I made that cheerful remark about the PCB's in the Hudson River which were dumped there in about the 1920's when no one knew there was any problem with them, and it needs to be written up, the situation we've got in New York City, on the Hudson River. The PCB's are on the river bed below Glenns Falls. They're now plumbing, but, anyway—we got the money in this committee to dig them up, dredge them up and replace them, about 10 years ago.

The State can't find a place in the whole of the Adirondacks where they will let them be buried.

Mr. STRELOW. In the meantime, Mr. Chairman, GE on its own, without any Government prodding, has spent well over $10 million in just the last 5 years to develop what we believe is an even better solution to toxifying these PCB's in place——

Senator MOYNIHAN. But in the meantime, PCB's are going downstream. That was a court agreement that Judge Sofaer was the arbitrator on, the mediator.

PCB's are going downstream. Our department of environment and conservation said, "You cannot catch any fish in the Hudson River, and particularly what are called rockfish in the Chesapeake Bay, but what we call——

Mr. STRELOW. Striped bass would be the ones affected here.

Senator MOYNIHAN [continuing]. Striped bass, because the PCB's are coming down.

In the meantime, we had what may have been the most interesting bit of urban design in the history of this century. It's called the West Way, which would build a park along the Hudson River, what we call the North River at that part, and get the river back for the first time since the early 19th century. A Federal court ruled, that under the environmental protection laws they couldn't build the West Way because it would interfere with the breeding of the fish which you can't catch because of the PCB's which you can't get out because of the environmental rules on landfill. That's kind of silly, isn't it?

Mr. **Strelow**. Well, it does, I suppose, show that these issues are often a little more complicated than they may seem at first.

Senator **Moynihan**. If you wanted a caricature of the thing, you would find it better, but I'm not in the business of caricatures. This is all very serious.

Mr. Lehr, we welcome you, sir, on behalf of the National Water Well Association.

STATEMENT OF JAY H. LEHR, DIRECTOR, NATIONAL WATER WELL ASSOCIATION

Mr. **Lehr**. Thank you, Senator.

What I have to say will be a brief summary of extensive comments that I have submitted for the record.

Senator **Moynihan**. Which we will put into the record.

Mr. **Lehr**. But also what I have to say which is a little different than what I have written could also possibly cost me my job——

Senator **Moynihan**. Now we don't want to cost you your job in these difficult times.

Mr. **Lehr** [continuing]. A position I have held for 21 years. I started in ground water science 34 years ago.

Senator **Moynihan**. You were with the Geological Survey, weren't you?

Mr. **Lehr**. Yes, in 1955, as a well driller and I drilled some of the early polluted wells on Long Island. My superiors informed me there was nothing we could do about it. There were no laws to protect ground water. I got more and more interested and went on to get the Nation's first Ph.D. in ground water hydrology 26 years ago.

Senator **Moynihan**. Where did you do that?

Mr. **Lehr**. The University of Arizona.

Senator **Moynihan**. In Arizona? Isn't that interesting?

Mr. **Lehr**. I couldn't get a job because nobody knew what to do with a Ph.D. in ground water. There was no concern. The university kept me there to teach other unsuspecting students this useless field of endeavor.

But as time passed, things got better and I helped to form a professional society.

Senator **Moynihan**. Things got worse and, therefore, better for you?

Mr. **Lehr**. Exactly, which is why I may end up losing my job, because there is absolutely no legislation being discussed here that will not benefit everybody that I represent.

I went to work for a professional society. It started out called the National Water Well Association. We now have another name called the Association of Groundwater Scientists and Engineers. For the past 22 years we have been publishing a research journal, "Ground Water," of which I am editor and publisher; additionally for about 18 years, I have edited a trade publication called, "The

Water Well Journal;" and for 8 years now we have provided a peer reviewed journal called "Groundwater Monitoring Review," dealing only with ground water pollution. We're the world's largest publisher of ground water literature with a catalogue 72 pages long.

We offer all of the scientist members of our association more than 100 short courses annually in advanced science that takes a calendar 4 feet long to describe all the programs, and we're a major research institute doing contract work for Government agencies in ground water. We have a staff of 70 people now.

Our membership grows at a rate of 200 per month. We now have over 15,000 members, and everybody involved in ground water science as well as our organization can only benefit from every piece of legislation being debated. Groundwater is clearly the most important environmental issue there is. I am happy to say I began testifying before committees of the House and Senate in 1968 trying to convince the people dealing with the water pollution control amendments then that ground water needed protecting, and in the ensuing 10 years many fine pieces of Federal legislation were passed with my help and that of my colleagues.

But today I have to question, in spite of the fact that our vested interest is to see more legislation, more money, more funding, more laws, looking at it from a 34-year perspective and the incredible increase in recognition of the problem among all of the public, among all Government agencies and among all scientists, I wonder whether we may not be taking one step forward and two steps backward to further entangle the States in more Federal regulatory programs when what they need is more moral support, more technical support, and more financial support.

I have heard a lot of really excellent things said here. Senator Durenberger's statement I thought was extremely well articulated, representing, however, the most conservative and fearful position, but I think he stated it very well and it has merit.

I was incredibly impressed with Senator Reid's comments and his desire that a ground water research center be set up in Nevada, which seems only fair. Since we're going to be dumping all our nuclear waste in its back yard, they should have the right to look into how to protect themselves from that waste.

I think Velma Smith's point that we've got to focus on source control is absolutely accurate, although I think her perspective of what gets done voluntarily is somewhat negative. I think both Mr. Strelow and Mr. Cunningham pointed out that there is much in the Toxic Substances Control Act that already does what is being recommended in some of the new legislation.

I think Mr. Giese's comments on what is being done voluntarily by the agriculture people is outstanding, and Mr. Olson pointed to the need for wellhead protection and the focus on protection.

All of this is quite valid. At the same time, the message I think all of this legislation is hopefully giving to the USGS, the EPA, and the Agricultural Research Service is that what is being done by them is not enough. They are not pursuing a coordinated or rapid enough path in order to tighten the safety net and protect us from ground water pollution, but I question all legislation which puts numbers and time limits and scientific constraints on those very agencies.

I think ambient standards are a scientific impossibility. At the same time I oppose classifications scheme that would place some aquifers as sewers, making decisions that our ancestors should have.

I oppose telling all of the agencies how they are to do research, when they are to do it, and when they are to deliver it. That is not the way science works. I do think they have to be prodded to work more closely together, to coordinate their activities, but they're already doing this.

We need more research money.

Senator **Moynihan**. Let me stop you right there.

Mr. **Lehr**. Yes.

Senator **Moynihan**. I was a member of the President's Science Advisory Committee. How do you force scientists to do anything?

Mr. **Lehr**. I believe that we're doing that right now. I think——

Senator **Moynihan**. You can try to induce them——

Mr. **Lehr**. I think we are inducing them. I think the hearings that you and other Senators have held in recent months which make it quite clear that ground water pollution is the No. 1 environmental issue, at least first among equals, and that you are not happy with what's going on, does create influence and does, in fact, induce a desire on their part to do voluntarily before you will tie their hands and force them to do it.

I think the legislative process we're going through here is absolutely magnificent. I think it is far more useful and effective often than the result of that exercise, which is a piece of legislation that creates limitations, if you will, requirements that reduce flexibility upon everybody that is a player in the game.

This is what concerns me. There are elements of every piece of legislation that we need, but I think that what will come out eventually of conference committees in passing both research bills and passing regulatory programs must reduce all of the specificity to the point where we still end up with the States having the right to be creative, to be flexible, to have greater funding resources. In other words, if what we end up here with—and this is very possible—is more rules and regulations and less appropriations, we will enlarge the gap that has already been spoken about between legislation and appropriation and even less gets done and more frustration occurs.

I'm saying, in spite of the fact that anything you do is going to result in tremendous benefit to the side of the community I represent, using my 34 years' experience and recognizing that tremendous strides—starting out with people not knowing what ground water is to everyone's knowing what it is, to having many pieces of Federal legislation, to making it almost a household word, we've come a long way. We've progressed tremendously scientifically. There are no scientific problems not being worked on today by researchers all over the country.

There is inadequate funding, but you name me a subject and I'll tell you the author of a proposal to look at that and an agency that wants to look at it, given enough funding. There really are not voids in our technological advancement. If it's going slow, it's a lack of funding.

The process is working. I have a more optimistic view because I have been here longer, and I just don't want to see the Senate cause us to drop back a few yards by virtue of laying on more administrative red tape than the situation warrants.

Thank you.

Senator MOYNIHAN. Thank you.

Your problem is one of indecision. You don't seem able to take a firm position.

What about that? We've got three—Mr. Poje, are you a scientist?

Mr. POJE. Yes, Mr. Chairman.

Senator MOYNIHAN. We've got three scientists and one lawyer. You can keep them honest, Mr. Strelow.

I'm always prepared to hear what Dr. Lehr has to say. When it finally gets established that there's an interesting subject that people don't know a great deal about, we have a science community that will rush in on that. The only areas that are dead in science are the ones where people say it's already been done.

You can distinguish two things surely; that is, the processes of inquiry and establishment of acquisition of knowledge, and then a different problem, what do you do about what you've learned? Have you learned things that say you'd better be doing something here and you aren't doing them?

I don't know that I ever would have thought of legislation as having much influence on the science of the matter. It seems to me that there are such things as fashions in science and people gravitate to where the rewards and the prestige are highest. You can see areas which really do need work, but nobody gets any—you don't get any Nobel prizes for doing it, so nobody does it, or you don't get tenure or what you will, or there is no journal and you have to start your own, but then some people get smart and start their own. The next thing you know, it's a prestigious document.

But are you saying we shouldn't be taking any measures, adopt any measures that are associated with what is done or not done? You can't do that; you must do this—that kind of societal regulation? Is that taking care of itself?

Mr. LEHR. I think to a large extent it is. You can't ever close the safety net.

Senator MOYNIHAN. All right, good.

Mr. LEHR. If we start off and we say we've got so many pieces of Federal legislation and they create a ground water pollution safety net, obviously there are big holes in that net. I don't think you can ever close all the holes; you would just be passing legislation forever. I think you do induce the public to voluntarily close those holes. I think that is being done.

I'm not opposed to all legislation. I'm sure that bills are going to pass and there's merit to all of them, but there will be revisions to all of those bills. The guidelines are, I think, to reduce the specificity because it really is happening and realize so many people coming into this field new don't realize how rapidly it's happening.

We today have now nearly 11,000 ground water scientists registered with our organization. Clearly, many of them are inexperienced and need a tremendous amount of training and they're really not competent to do much of the work. But, just as you point out, it's a hot issue and science has moved in because the rewards are great.

While we'll go through a rocky period of some bad work being done by inexperienced people, it's part of the growing process. We are creating the cadre that is going to solve these problems in the next decade or let's say make it imminent to the public that the problems are on their way to solution.

Senator MOYNIHAN. Mr. Olson, why is Dr. Lehr wrong?

Mr. OLSON. Well, I think first of all we need to make a distinction between the kind of basic science we're talking about—by the way, I'm not a scientist; I'm an attorney also, I must admit.

We need to make a distinction between the kind of basic research——

Senator MOYNIHAN. Don't feel bad; there is not—with the exception of our colleague from the American Association of Advancement of Science, the Committee on Environment and Public Works does not have a single scientist. If the nitrogen was coming out of those light bulbs, we wouldn't have anybody here to tell you whether it was good for you, bad for you, true or untrue, or consequential or not. We are entirely made up of people who feel good about things and, therefore, write good legislation.

Mr. OLSON. The point I was going to make, though, is that there are these basic science questions that are probably not going to be influenced except to the extent that there are Federal appropriations to pay to research them.

Then there is the question about what you do about controls. In my testimony on pages 21 through 25 I've gone through a list of all the sources where controls are inadequate—I'll just give a couple of examples. Ninety percent of the landfills have no liners to protect the underlying ground water. That's a basic, very easy to do item, but it's something that we're not doing.

I go through a whole list of that type of problem. It's not a question of science; it's a question of whether we as a society have the will to require that those controls be placed onto those sources.

I think Dr. Poje probably has some thoughts on whether S. 1105's toxicological testing requirements are necessary or not.

Mr. POJE. I think you raise a very interesting point here: what is the role of science in sort of driving this process and can we rest upon scientists in their own right, having conducted their investigation, to lead us as a society into the proper direction?

I think since we raised the point in our testimony about the issue of clean air as an example of where we were told 20 years ago we didn't need to do any regulation, I think there's an example of science that perhaps can inform our thinking on this issue, right now, with groundwater.

In 1974, Dr. Sherwood Rowland from California analyzed the impact of chlorofluorocarbons on stratospheric ozone, making the hypothesis that these chemicals, when rising into the ozone, had potential for destroying the ozone layer. Now it isn't until 1988 that we are actually picking up the cudgel that was thrown down by Dr. Rowland to deal with those scientific facts and to deal with them in a responsible fashion. We are driving ourselves toward saying as a global society that we're going to take control measures, and the debate is over at how rapid a pace we can take those control measures. But certainly the direction is not being debated at this point in time.

I think the sense of science influencing our thinking on this issue with ground water is one that bears some investigation. My field is toxicology. I grew up working on the Hudson River investigating PCB problems involving the striped bass on the Hudson River. I also spent some time in Ohio working as an academic at Miami University, but then going on to serve on the advisory panel to the State on ground water management. I headed up a subcommittee on toxics in drinking water supplies for the State of Ohio.

While some people may share a sense of enthusiasm about States' capacity to just sort of see some guidance, flimsy guidance, at the Federal level and pick it up and run with it, I don't share that sense of confidence.

In terms of the science, some very important questions are left begging, questions that are extremely important, on the issue of health effects from ground water contaminants. Yes, we've seen instances in the Midwest where nitrate contamination of wells has led directly to the poisoning of infants and some of them tragically resulting in death.

The much more troublesome aspect of all this, of course, is the chronic contamination problem with chemicals at much lower levels than those that are able to cause catastrophic illness in a population in an acute sense.

We have yet to answer the questions about current contamination and its impact on population because of the questions of latency. Some of these contaminants, as this committee is well aware, can show up 20 years later in illnesses in the population.

We have heard people, and I've heard people claim that epidemiological science would tell us if there was a problem with some of these chemicals at this level of contamination. Well, there are problems with epidemiological surveys because of the way they aggregate groups of people, some of them heavily exposed, some of them lightly exposed, and come up with a profile that would say the most sensitive subpopulation is not being affected when it actually could be affected at a very high level.

The toxicological data question has been raised. It's very interesting, but all of the toxicological data and the impact of these chemicals has yet to be divined. Ground water contamination with a pesticide like aldicarb, in a study from only as recently as a couple of years ago in Wisconsin indicated that there may be some impacts on the immune system.

The great flurry of activity going on at the National Cancer Institute and other major medical institutions on how the immune system works has yet to be fed into an understanding of what this, albeit perceived to be, low level of contamination is actually having on human physiology, human neurobehavioral effects, and certainly effects on into subsequent generations.

We are filled with uncertainties from a toxicological perspective as to the exposure scenarios with these chemicals. Most of the toxicological data that is being generated today and is being generated on a national scientific basis involves a single chemical with an animal test system, following that out over time to uncover what all the adverse impacts are at what levels.

Unfortunately, our experience as a people with exposure to chemicals tells us that we're getting sequential exposures to different chemicals or simultaneous exposures to different chemicals. The toxicological literature cannot tell us what the significance of those kinds of exposures actually are.

Then finally we get to the issue of, "Do we know what we're being exposed to", the monitoring information? A rather telling tale comes out of this.

EPA in August of last year issued what were called draft health advisories for pesticides in drinking water. Of course, under the Safe Drinking Water Act, only six pesticides are currently required to be monitored in public water supplies. Private water supplies are afforded very, very little protection in terms of assessing the quality.

EPA's assessment of 50 pesticides for drinking water health advisories shows us that for only 15 of those chemicals were there standard analytical methods and detection limits for those pesticides, for seven of the pesticides that they were setting levels for in drinking water, there were no analytical methods available to detect those chemicals.

Consequently, what I am saying is that we have a very, very small window that we are trying to view the existing burden of chemical contamination. We don't have the techniques right now to assess what all those contaminants are.

To sacrifice public health at this stage of uncertainty for continued practices which we can recognize now are actually unsafe and unwise—I believe we can't wait for the risk assessment to tell us how dangerous those practices have been.

Senator MOYNIHAN. All right.

Mr. Leavitt, what do you think?

Mr. LEAVITT. I have to agree that we should not wait for risk assessments to come in, but we should use risk assessments as part of the work that we are doing to establish groundwater protection.

Source controls are clearly the best way to achieve ground water protection. You cannot rely on cleanup even though what we are seeing today is primarily clean up of a long history of contamination which when it was done was perfectly fine.

Senator MOYNIHAN. When it was done, it seemed innocuous?

Mr. LEAVITT. I'm sorry?

Senator MOYNIHAN. When it took place, it seemed innocuous?

Mr. LEAVITT. It seemed innocuous; correct.

Our concern is that you cannot at a Federal level dictate source controls to a local hydrogeology and expect that what you specify is going to be appropriate anywhere in the country. The geology, the land use——

Senator MOYNIHAN. Your Madison County—that is Madison County?

Mr. LEAVITT. Madison County; that is correct.

Senator MOYNIHAN. You just don't know enough about Madison County?

Mr. LEAVITT. Well, what I'm saying is that what you do here, there's such a diversity within the country of uses of ground water, of existing ground water quality, of different geologies that if you set up a source control program here, it's going to be in error most of the time. You are far better off setting up your source control programs at the State level and allowing them to——

Senator **Moynihan**. Would you write this committee a paper on why that is so?

Mr. **Leavitt**. I'm sorry?

Senator **Moynihan**. Would you write us a short paper on why we will be in error most of the time?

Mr. **Leavitt**. Certainly.

Senator **Moynihan**. I'd like to hear it.

And anybody else who would like to do that, including you, Mr. Strelow.

Under the rules of the Senate, we've reached a point where we can't be in session. The committee has to close down for the day without unanimous consent to continue, and I did not get it when I went over to the floor because we were voting.

So we will end the hearing, but we won't end this subject by any means. We want to thank you. We want you to understand that we take very seriously all of the things you have said. We hope it will be said of us that we have tried to attend to some measures of methodological rigor even if we are not ourselves methodologically literate. It is possible to do one without being the other.

We thank you all very much. We thank our audience for its listening. I look forward to a paper from you, Mr. Leavitt.

[Whereupon, at 12:28 p.m., the subcommittees recessed, to reconvene at the call of their Chairs.]

[Statements submitted for the record follow:]

STATEMENT OF EDWIN H. CLARK, II
VICE-PRESIDENT OF THE CONSERVATION FOUNDATION

BEFORE THE

SUBCOMMITTEE ON
WATER RESOURCES, TRANSPORTATION AND INFRASTRUCTURE

AND THE

SUBCOMMITTEE ON
HAZARDOUS WASTES AND TOXIC SUBSTANCES

OF THE

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

FEBRUARY 23, 1988

Mr. Chairmen, I am Edwin H. Clark, II, Vice-President of The Conservation Foundation. It is a pleasure to appear before you to discuss the increasingly critical issue of groundwater protection and management. As I'm sure you know, The Conservation Foundation has been deeply involved in this issue for several years now, and we are pleased to be able to present our thoughts at your hearing today.

The Conservation Foundation is a private, nonprofit research, communications and consensus-building organization dedicated to improving the quality of the environment and promoting the wise use of the earth's resources. We have been actively involved in water resource policy for nearly two decades, beginning with water quality and coastal resource concerns and now in matters of soil erosion, water conservation and management, instream and riparian protection, and of course groundwater.

In 1983, The Conservation Foundation joined forces with former Arizona Governor Bruce Babbitt and The National Governors' Association to create the National Groundwater Policy Forum. Evidence of widespread groundwater contamination across America from a diversity of sources made it clear that strong and coherent action was needed. But federal policy on groundwater was incomplete and fragmented at the time, depending upon a variety of environmental laws that did not have groundwater protection as their primary concern. Some states were paying increasing attention to the problem, but others held back for fear that new federal requirements would conflict with their own efforts.

The National Groundwater Policy Forum was formed to address this lack of coherent policy guidance, and to counteract the tendency towards polarization in the nation's environmental debates. Now, though a variety of actions are occurring at every level of government, nearly a year after the release of the Forum's final report a coherent national policy has yet to emerge. The Forum's recommendations are thus even more timely and salient.

The National Groundwater Policy Forum: Process and Product

The Groundwater Forum was chaired by Governor Babbitt. It had, among its 17 members, state governors and officials, chairmen of major corporations, heads of environmental groups -- myself included -- a county executive, and top groundwater professionals. This was truly a blue-ribbon panel.

The Forum's activities continued throughout 1985, and were highlighted by three meetings of the full Forum and three meetings of the top staff representatives named by each Forum member. Between meetings, Forum staff -- provided by The Conservation Foundation -- were in close and continual consultation with members and representatives to formulate the group's report. Forum staff responded to a steady stream of inquiries from interested citizens, and also met frequently with personnel from EPA, the Department of the Interior, congressional committees, and business, environmental, and professional groups. After the Forum's publication of proposed conclusions and recommendations in November 1985, we held three sets of well-attended public hearings in Texas, Wisconsin, and New York to solicit reactions to our proposals.

Throughout this extensive process, we had as our goal the articulation of a thoughtful, organized, persuasive national program for groundwater management and protection. This program was to assign responsibilities for groundwater among all levels of government and the private sector. The Forum itself was to be independent of established institutions and yet to have sufficient prestige and diversity in its membership, and quality in its work, to influence the course of groundwater protection across the nation. I would like to summarize for you some of the conclusions that we came to during the Forum's deliberations, and present the Forum's major conclusions.

The first conclusion of our work was that groundwater contamination is a serious and growing problem. It is difficult to measure precisely the nationwide extent of contamination, because of the technical problems with and the cost of monitoring groundwater quality together with the fact that groundwater pollution spreads slowly. Nonetheless, our research turned up tudies with some disturbing findings. In 1984, 8000 water upply wells nationwide were reported to have unusable or egraded water due to contamination. Between 1978 and 1981 lone, water supply for millions of people was affected by the losing of hundreds of wells because of pollution from toxic rganic chemicals. Almost two-thirds of the rural water supplies tested (drawn almost entirely from wells) exceeded drinking water standards for one or more contaminants in a 1984 EPA survey. Altogether, more than 200 contaminants -- ranging from toxic organic chemicals, to metals, to biological organisms, to radionuclides -- have been identified in groundwater across the United States.

As the Forum concluded, we are "not yet facing a groundwater crisis.... The challenge is to prevent these threats from creating a crisis." The Forum had several key recommendations directed to this end.

A Federal Law

Although, as I describe below, the Forum recommended that the states clearly have the lead responsibility in managing and protecting their groundwater supplies, it also recommended that Congress enact national groundwater legislation.

The first purpose of this legislation would be to establish a national goal for groundwater protection. The Forum recommended that this goal be:

> To protect the physical, chemical and biological integrity of the nation's groundwater resources and ensure that they are not degraded in any way that may be harmful to humans or the environment.

The second purpose of the Federal legislation would be to require each state to establish groundwater protection and management programs that would achieve this goal. The Forum made specific recommendations about what elements the state programs would have to include, at a minimum, to meet this test.

The third purpose of the legislation would be to provide for, and coordinate the provision of, technical and financial assistance to the states to help them more effectively carry out their groundwater protection and management responsibilities.

The bills before us for comment today respond to some but not all of those recommendations.

None clearly establishes a national goal for groundwater protection. The state members of the Groundwater Forum believed that a national goal ensuring national consistency was extremely important to allow the individual states to proceed with their programs. Unless the federal government establishes this goal and enacts certain other national requirements to protect groundwater, the competition for economic development among states might tempt some to trade short-term economic benefits for lasting damage to irreplaceable aquifers and to public health. The states represented on the Forum themselves voiced concern that pollution havens would develop in other states if national requirements for protection were not established. We cannot afford to run that risk.

One of the bills, S. 20, does require the states to establish groundwater protection programs, but I believe that the content of these programs needs to be expanded and the inducement for the states to adopt them needs to be strengthened. I will comment in more detail about both of these issues below.

All three bills do provide for some of the technical assistance that the Forum called for, and S. 20 would authorize some financial assistance as well.

We do, however, question the wisdom of enacting a bill as detailed and extensive as S. 1105 at this time. The research specified in this bill appears to be part of an unspecified but substantial regulatory program. It is difficult to know how useful all this research might be until the manner in which it is to be used is set forth. As it stands, the bill would impose requirements substantially exceeding any likely funding that is appropriated, would require research that may dublicate other research already under way or required elsewhere in the bill, and provides little or no effective mechanism for ensuring that all this work is adequately coordinated, or is done in a way that is of greatest benefit to the potential users. In periods of tight budget constraints, a bill that authorizes everything to be done is of little value in setting priorities. We would be happy to provide more detailed comments on this bill if they would be of assistance to the committee.

H.R.791 seems to avoid many of the problems of S. 1105. In particular, it seems to be clear that the reserch being authorized is to be in response to information needs identified by state and local governments in implementing their groundwater protection programs. As I indicate below, this is the level of government that we believe should clearly have the lead responsibility in the nation's groundwate protection efforts, and thus H.R. 791 fits in with our concept of how the regulatory programs will ultimately be formulated. We might suggest, however, that the bill make provisions for having health and environmental effects testing conducted by private companies producing the chemicals of concern when this is appropriate. I believe that this could be done by making a cross reference to section 4 of the Toxic Substance Control Act (TSCA) and to the equivalent testing provisions of FIFRA.

In short, although the bills include some of the elements of the legislation recommended by the Forum, (and in some cases in substantially greater detail than specified by the Forum) I do not believe that, in total, they adequately define the federal role which I believe is vital to induce the states to take action and to assure consistency and equity among the states.

State Leadership:

Although the Forum recommended that Congress enact Federal legislation, it strongly believed that the states should clearly have the primary responsibility for implementing groundwater management programs. The occurrence and behavior of groundwater are infinitely variable. No national regulations could adequately respond to the diversity of conditions and threats. In addition, many sources of potential contamination, such as septic tanks, agricultural chemical applications, and underground storage tanks, number in the millions. Their regulation could probably never be effectively undertaken by the federal government. Only if the joint efforts of state and local governments can respond to this variability can we hope for effective protection and management.

Of the bills before us today, S. 20 does clearly assign the states the lead role in developing the protection programs. The other two, dealing primarily with research, are essentially silent on this issue. We would strongly support the state centered approach of S. 20, with the additions that I mentioned above of increased specification as to what these programs should include and stronger inducements to the states to actually implement these programs.

A Ten Point Management Program:

A third recommendation of the Forum pertained to the content of a comprehensive groundwater management and protection program. The Forum concluded that a program that focuses on only one part of the problem -- for instance, source controls or groundwater standards -- would not suffice to provide the protection that this valuable resource requires. Instead, the programs should take a comprehensive resource management approach which incorporates but extends beyond traditional pollution control approaches.

The Forum recommended that the states adopt comprehensive, ten point management programs which include:

- Comprehensive mapping of aquifer systems and their associated recharge and discharge areas:

The states cannot effectively manage the resource if they do not understand where the water comes from, how it flows through the aquifer, and where it goes. Obtaining this understanding can, of course, be very difficult, expensive, and time consuming. The implementation of the rest of the program should not wait until this understanding is complete, but any effective program requires a continuing effort to understand better the resource it is attempting to manage.

- Anticipatory classification of Aquifers:

Classification is one of the more contentious issues in the groundwater debate. The Forum came out in favor of classification, concluding that "a well-considered system for classifying groundwater resources is an essential tool to help agencies manage these resources more effectively, with respect to both the prevention of future contamination and the management of contamination that has already occurred. The Forum did, however, recognize that a state might reasonably want to assign all of its aquifers to one class, which is essentially what the State of Wisconsin does. This decision along with the decision about how the classification system would be defined would be completely up to the state. The Forum did, however, conclude that the system should be established at the outset of the program to guide further decisions rather than having classification decisions had on an ad hoc, after the fact basis.

- Ambient Groundwater Standards:

The Forum supported the establishment of ambient groundwater standards based upon scientific risk assessments. The ambient standard approach taken in S. 20 is, I believe, fully compatible with the Forum's recommendations.

- Authorities for imposing controls on all significant sources of potential contamination:

Adequate source controls are clearly the first line of protection for groundwater. A program that relies primarily upon monitoring ambient quality is likely to find out that it has a serious problem only after it is too late to do anything about it. These controls should include both point and nonpoint sources.

The Forum recognized that these authorities could take two forms. One is controls over the amount of waste that any facility or operation could discharge to the ground, and the other is controls over where potentially sources of contamination can be located. The Forum thought that rigorous discharge controls should be required as part of any state program, and strongly endorsed the second approach as well, although recognizing the sensitivity of the federal government getting explicitly into land use questions. Indeed it is difficult to conceive of an effective program that does not include some elements controlling the siting of facilities in sensitive recharge areas.

o Programs for monitoring, data collection, and data analysis:

The Forum concluded that substantially more and better information was needed on groundwater quality in order to define an efficient management program, and to ensure that the program is effective once implemented.

o Effective Enforcement Provisions:

No management and protection program will be effective unless it is backed up by vigorous inspection and enforcement provisions.

These were the elements that the Forum recommended be required in any state groundwater protection program in order for it to be approved. It also strongly recommended that the groundwater quality programs be closely integrated by the states with their groundwater withdrawal programs, with their surface water management programs, and with other environmental protection and natural resource management programs.

To repeat, the Forum concluded that the need is for programs that provide comprehensive protection and management of the resource. The job at hand is a good deal bigger than simply controlling potential sources of contamination. Remember that groundwater has become our dump of last resort for pollutants from all other media -- for sewage sludge and effluent, for solid and hazardous waste, for flue gas scrubber residuals. Yet groundwater might be the least able of all media to cope with this abuse.

Real, lasting groundwater protection therefore demands programs that extend beyond the traditional approaches to pollution control. We must generate an improved understanding of the resource itself -- the physical properties of the aquifers, and the quality and quantity of water they contain -- as well as better control over the uses and potential threats to groundwater.

The Forum's recommended 10-point program would equip the state and local authorities, assisted by the federal government, with both better understanding and control. And it would provide them with the ability to prevent contamination before it occurs, which is central to all of our efforts. Prevention must be the cornerstone of any initiative to protect and manage groundwater, because it is much cheaper and more effective than after-the-fact remediation. The ever-mounting cost of the Superfund program bears painful testimony to the expense of clean-up. And it also reminds us that, if groundwater is mismanaged, a costly federal bail-out is rarely far behind. This time, let's get ahead of the curve.

Conclusion

In sum, I would like once again to commend the efforts of these Subcommittees to develop groundwater legislation that is effective and timely. The National Groundwater Policy Forum invested a great deal of time and energy in building a consensus on groundwater policy among diverse interests. One element of that consensus was that the time for action is now, before the problem gets worse and we do begin to experience crises. I think the Forum produced recommendations that are worthy of close consideration. We believe that the Forum's recommendations have already had an important influence on the nation's groundwater policy debates, and hope that the nation's discussions will continue in the moderate, thoughtful direction that the Forum's efforts have charted.

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ENVIRONMENTAL POLICY INSTITUTE

Testimony of
Velma M. Smith
Director, Groundwater Protection Project
Environmental Policy Institute

before the

Senate Committee on Environment and Public Works
Subcommittee on Water Resources, Transportation and Infrastructure
and
Subcommittee on Hazardous Wastes and Toxic Substances

March 24, 1988

Distinguished Chairmen, members of the Subcommittees, my name is Velma Smith, Director of the Groundwater Protection Project for the Environmental Policy Institute. On behalf of EPI, I thank you for this opportunity to testify and commend you for your strong interest in addressing the nation's growing problems with groundwater contamination.

Groundwater is a vast and important national resource. In volume, our groundwater resources are some 20 times greater than all of the freshwater in our rivers, lakes and streams, and the availability of clean water from underground sources affects virtually all Americans.

Today some 117 million citizens rely on groundwater for drinking water; included in that number are 97 percent of rural households and more than one-third of the 100 largest U.S. cities. Forty percent of agriculture's irrigation needs are met by groundwater, and more than one-fourth of industrial water used in the U.S. comes from underground water sources.

218 D Street, S.E., Washington, D.C. 20003 (202) 544-2600

Furthermore, groundwater is intimately connected with surface water, and the quality of our rivers and streams is undeniably linked to the quality of water flowing through aquifers which may or may not currently be tapped by wells. For example, some estimates indicate that a billion gallons of groundwater per day seeps into the Atlantic and Pacific Oceans and an average of 30 percent of the flows of surface streams comes from groundwater. Thus, polluted groundwater affects not only human beings who may drink that groundwater but also fish, wildlife and surface-water users.

Yet, despite the importance of the groundwater resource to both human health and environmental quality, its need for protection seems to have been overlooked for many generations, and today we are faced with a growing recognition that America's groundwater is in serious jeopardy.

Groundwater contamination is no longer discussed as a remote possibility affecting only a few communities. While a large percentage of the total resource may remain unpolluted today, groundwater problems have been reported in every state of the nation. Literally thousands of wells have been closed, and nearly 80% of the sites identified on the Superfund National Priority List manifest problems with groundwater contamination.

We do not have today nor will we ever have a complete picture of groundwater quality throughout the nation, but much of the data we do have is troubling indeed.

> The U.S. Geological Survey, after testing more than 120,000 wells across the country, found nitrate contamination in 48 states, with contamination levels in some states exceeding health standards in over 20 percent of the wells tested.

> Data from EPA's Groundwater Supply Survey, released in 1983, showed the presence of one or more industrial solvents in 28% of the randomly selected groundwater supplies serving populations of more than 10,000 persons.
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> In Iowa, State officials have cautioned that as many as half of the State's 800 public water supplies may be contaminated with pesticides and other organic contaminants.
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> A 1987 survey of private and public water wells in Minnesota found pesticides in 37 percent of the samples tested. Of the 225 private wells tested, more than 50 percent contained at least one pesticide.
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> EPA's efforts to collect and review state pesticide detection data now indicates that some 45 to 50 pesticides have been detected in the groundwater of over 30 states. Reportedly, these detections are associated with legal application, not point sources such as storage, mixing or disposal.

And lest we forget -- as we tend to do -- that groundwater and surface water are connected, let me mention a few other problem examples.

> Discoloration of the swimming pond for two children's summer camps in New Hampshire in 1984 apparently prompted water quality sampling, which in turn indicated pollution with iron, manganese, acetone, toluene and methyl ethyl ketone. Leachate from a nearby landfill was reported to be the likely culprit.
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> In 1985 the completion of a gas production well in Virginia had an unexpected effect. Grout pumped into the newly drilled well traveled through the groundwater to a spring which feeds a State-owned fish hatchery. Thousands of trout were lost and thousands more had to be transported to a clean water source.
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> At one Superfund site in Maine, chemicals such as TCE, toluene and methylethylketone seep from the groundwater, along the shore and into the Annabessacook Lake. The source of the problem -- landfilled industrial waste located about a quarter of a mile from the Lake.

One could argue that these last examples are less representative of broad patterns, more clearly isolated instances. Frankly, I would be pleased if that were true, but given the fact that there has been little effort on the part of either state or Federal regulatory officials to focus on the surface water impacts of groundwater pollution, I fear that these particular anecdotes may be surrogates for other similar problems occurring across the country.

Perhaps we face these unsettling statistics and troubling cases today because we entered the chemical age -- and clearly enjoyed its benefits -- with a mistaken notion that groundwater is immune from contamination. And now we find that we've manufactured and used a host of substances, from degreasers to dioxin, with little regard for their potential to pollute groundwater. Historically, we haven't worried too much about landfilling our garbage, pouring or even pumping toxic chemicals into the ground, reapplying chemical fertilizers and pesticides on farm fields year after year, or storing wastes in slowly leaking ponds.

Now it becomes clearer everyday that groundwater is not uniquely protected from contamination. In fact, groundwater is vulnerable to contamination from a wide variety of activities that occur in every community across the nation.

The diversity of groundwater contamination sources runs the gamut from the homeowner's malfunctioning septic tank to the byproducts of the nation's defense system. Oil-drilling, road-deicing, farming, mining, chemical storage and just "throwing away" our household trash may affect and degrade groundwater resources. The Office of Technology Assessment in its report entitled Protecting the Nation's Groundwater from Contamination compiles a large list of groundwater contamination sources, and the National Research Council in Ground Water Quality: State and Local Strategies warns that "virtually all human activity" may affect groundwater.

Along with the diversity of causes, we also find a diversity of existing Federal and state authorities to prevent, detect and correct groundwater contamination. At least eight major Federal laws speak to the issue of groundwater to some extent, and within each state it is possible to find as many as seven agencies dealing with groundwater issues. In 26 states or territories numeric water quality standards can be applied to groundwater; 15 states or territories use narrative standards; and 23 utilize both narrative and numeric groundwater quality standards. The same recently released General Accounting Office Report that provides us with those statistics also indicates that at least 22 states have written groundwater plans or strategies.

But while the states write "strategies" and the lawbooks provide us with a great many pages of text devoted to groundwater, there are hundreds of communities across this country with citizens who will attest to the failure of those laws, the associated regulations and enforcement mechanisms that are supposed to give their groundwater adequate protection.

Perhaps one of you has heard from a community where a public water supply has been contaminated and the town or the county is seeking a new treatment system or water source; they call your office because they presume, unfortunately wrongly, that there must be a program of Federal assistance for such cases.

At least one Congressional office has struggled with a slightly different but nonetheless difficult problem. In that Congressional District, in a small, rural community with no centralized water system, individual families were discovering -- literally home-by-home -- that their wells were tapping into methane as well as water.

Or some of you may have spoken with people who found that their water was contaminated but were lucky enough to find other water sources without great delay and major expense. Still, someone in that family may be ill and the family members remain haunted by the question and the doubt about a possible link between that illness and the unknown length of exposure to tainted water.

For those people who have called your offices and for the people who may never make it to a Congressional hearing and never comment on a Federal regulation -- but nonetheless depend upon you and our system of government to protect their interests -- we urge you to come out of these deliberations with a program which offers real and lasting protection to our irreplaceable groundwater resources.

To draw a phrase from the Report of the National Groundwater Policy Forum, what we need is "Action Now." Today, numerous major national environmental groups are pleased to make that call for action.

While the members of Congress have been studying and debating groundwater protection options, a group of environmental organizations has also been deliberating over the measures for groundwater protection. These groups, including the Environmental Policy Institute, National Wildlife Federation, Natural Resources Defense Council, Environmental Defense Fund, Clean Water Action Project, U.S. Public Interest Research Group, Izaak Walton League, National Audubon Society and Friends of the Earth, are pleased to have this opportunity today to share the conclusions of our debate. Today we call on Congress to adopt comprehensive Federal groundwater protection legislation, and I will outline for you the general principles which we would jointly urge this Committee to adopt. As this Committee proceeds with this debate, these various organizations look forward to working with you and providing more detailed options and proposals based on the general framework which I will outline.

We begin with the assumption that Federal legislative action is necessary. But in making that call we do not lose sight of the fact that laws related to groundwater already abound. What we call for today is not just another environmental law but a law which corrects the fundamental flaws inherent in our current approach to groundwater problems and one which will be matched with a commitment of political will and resources to fully carry it out. Anything less will be but a hollow promise to water users today and in the future.

This morning I will highlight eight key points which address our past groundwater failures and offer hope for new solutions.

First, we must recognize that groundwater will not be protected by programs that merely respond to contamination after the fact. There is widespread agreement and painfully clear evidence that groundwater cleanup is technically difficult and expensive. Yet most of the governmental resources devoted to groundwater remain directed toward cleanup, not prevention. This is true even beyond the multi-billion-dollar Superfund effort, for many of our existing regulatory approaches rely primarily on detection of contamination to trigger control of discharges.

So, borrowing from the Federal Clean Water Act, we call for a national goal to protect and enhance the physical, chemical and biological integrity of the nation's groundwater resources.

Adoption of this goal will not bring an automatic end to all groundwater pollution discharges. Rather, this ambitious goal will guide both Federal and state policy decisions with a determination that no avoidable pollution is "acceptable." It will set the basis for programs to protect the groundwater resource -- not just our predicted "uses" of that resource. It will signal a commitment that should drive our shared resources and ingenuity toward crafting and achieving better means of pollution prevention so that future generations of Americans are not left with a legacy of polluted water.

Second, the ultimate answers to groundwater protection cannot ignore the connections of groundwater to surface water and the interrelationships of other environmental media with groundwater. Therefore, we seek a Federal groundwater program that will stop the national pollution shell game and instead seriously promote waste reduction and improved chemical efficiency. Rather than forcing future generations to forego the use of water resources, we believe we would do better to forego today the use of some toxics and to eliminate the generation of wastes. The highest and best use of groundwater, afterall, is not as a sink for chemical residues. Nor, we suspect, is the best use of produced chemicals as an additive to groundwater.

We will recommend that the nation adopt 5, 10 and 15-year target numerical goals for waste reduction and we will urge the Federal government to provide technical and financial assistance to states for targeted research and demonstration projects on waste reduction, reuse and recycling.

Third, we must not make the mistake of waiting to control groundwater discharges until we develop full and unassailable toxicological profiles for the tens of thousands of chemicals in use. In other words, we cannot let standard-setting set the pace for pollution control. A look at our experience with standard-setting, data-gathering and risk-assessment on a chemical-by-chemical basis with the Safe Drinking Water Act, the Clean Water Act, the Toxic Substances Control Act or the Federal Insecticide, Fungicide and Rodenticide Act indicates that that approach is less than expeditious and fraught with problems and uncertainty.

Numerical water quality standards have a role in resource protection, but they cannot serve us effectively if we use them either as the sole basis for action or as a government-sanctioned license to pollute. The first line of defense in Federal groundwater legislation must be source controls, not water quality standards.

We believe that effective groundwater protection throughout the nation will occur only when the Federal government acts to adopt a national program of source controls to minimize or eliminate discharges of pollutants and toxic chemicals to groundwater. There must be minimum Federal standards of care and control for sources and activities which have the potential to pollute groundwater resources.

The source control approach -- which comes to us in the Clean Water Act in the form of technology-based controls on wastewater discharges established and applied uniformly to various categories of facilities nationwide -- is one which our coalition believes can work for groundwater protection.

It is the most direct approach to pollution abatement. Indeed, it is where any groundwater protection scheme must eventually arrive. It provides for equitable treatment of all polluting sources; it guards against economic blackmail in individual states and communities; and it rewards environmentally sound activities by requiring uniform results across economic sectors.

For certain sources of contamination, we believe that the first and most fundamental level of control should be specified in the Federal legislation, generally for immediate application. "Statutory standards," under our coalition's proposal, would provide for necessary reforms to eliminate clearly unacceptable practices or technologies which threaten groundwater -- much in the way that Congress addressed the significant problems of leaking underground storage tanks by banning outright the installation of bare steel tanks.

Examples of the type of statutory standards that our proposal will call for include:

> A requirement for backflow devices on all irrigation wells that may be utilized for direct application of fertilizers and pesticides;
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> A ban on septic tank or other on-site sewage treatment system cleaners containing toxic synthetic organic chemicals;
>
> A prohibition on road-spreading, deicing or dust abatement with oil brines or other oil production wastes.

Beyond these least technical and least complex statutory standards, we intend for Federal legislation to direct EPA to establish two additional levels of source controls: Best Practicable Methods (BPMs) and Best Available Methods (BAMs). This two-tiered approach promises fairness and equity among the regulated community and provides for a reasonable consideration of economic and technological constraints to pollution prevention.

In developing the BPM regulations -- including technology, design, operation and maintenance and monitoring protocols -- we believe that EPA should be directed to select the best control methods and practices which would be generally available to or attainable by the preponderance of sources within a given category. However, economic impacts should not be considered for individual sources or for any subcategory so situated as to present an inherent threat to groundwater quality, such as placement of waste piles over high water table areas.

On a schedule that would follow that for the BPMs, we believe that EPA should develop a more stringent set of requirements for each groundwater pollution source category -- best available methods. As the name implies, EPA would not, in this round, be selecting controls that were necessarily generally available. Instead and in line with our focus on source reduction and waste elimination, we would require this highest level of source control to be based on consideration of the full range of mitigation, source reduction and recycling techniques available for a given category of activity.

The states, in our view, should then be empowered to build upon these minimum Federal requirements. They should be provided with sufficient flexibility to authorize alternative but equally effective means of achieving pollution prevention and waste reduction, but they should not be provided with the flexibility to choose not to apply protections toward all or a portion of their groundwater resources. Nor should they be provided with the power to excuse individual sources from the basic requirement to employ all means available to prevent groundwater discharges.

Fourth, effective groundwater protection programs must be comprehensive. The nature of groundwater demands an ambitious program of source controls for implementation by the states. We cannot apply controls only to the easy targets -- the large industrial facilities -- and expect to make the kind of improvements that are necessary. With groundwater, we must address point and nonpoint sources, and we must effect changes in the behavior of "polluters" who have previously escaped or been only lightly touched by environmental regulation.

For our proposal, we have drawn from the Office of Technology Assessment's 1984 report on groundwater, and we will recommend that Congress mandate source controls for a large number of source categories. While we urge that a portion of these source controls be implemented through individual permits, we recognize the need for general permits for certain ubiquitous sources of contamination, such as the household septic tank.

Fifth, a Federal groundwater protection program must provide for fair and equitable treatment of all citizens, regardless of their place of residence. Just as citizens of particular states should not be denied minimum national protections, the citizens of rural areas must not be discriminated against through a program that ignores the needs of private or small community well users.

Currently there may be from 37 to 48 million Americans, living primarily in rural areas, who rely on private drinking water wells. Those drinking water wells are not covered by the mandates of the Safe Drinking Water Act. And while this particular exclusion is probably a reasonable one, it unfortunately translates into a lack of protection for the waters which feed those wells. When a pollution problem does occur, private well users or small community well users are generally least able to deal with the consequences. Without the economies of scale of large water supplies, they are unable to spread out the costs of monitoring, treatment or water supply replacement among numerous water users.

Our coalition recognizes these problems and calls for several actions to address them. We support the adoption of a national goal of safe drinking water for all Americans -- not just those served by public water supply systems. We recommend that states be required to set up programs for both water quality monitoring and water well replacement for private well owners. The costs of these programs should be shared by water users along with the state and Federal governments. Further, we urge Congress to call a halt to any Federal program or policy, such as EPA's groundwater classification proposals, which would allow for groundwater pollution simply on the rationale that only "small populations" would be affected.

Sixth, a new national groundwater law must reject the notion that the groundwater resource lends itself to control programs based on predictions of assimilative capacity or calculations of "acceptable" pollutant loadings. Our aim must be to protect the full resource, not degrade selected segments of it. In this context, however, groundwater classification -- based on adequate data about aquifer flow systems -- can be used to further broad-based protection goals.

Under our proposal, anticipatory classification -- in programs such as wellhead protection and critical aquifer protection areas -- would be utilized to provide for an additional level of protection for particularly vulnerable or particularly crucial groundwater resources. Imposition of additional controls, over and above those required by the Best Practicable or Best Available Methods, would be appropriate in areas designated by the states for such protections. In no case should classification be used to lessen the stringency of established source control standards.

Seventh, water quality standards best serve the purposes of groundwater protection when they function as an adjunct to source controls, not a license to pollute. Thus, standards should be set and utilized in the context of a program which prevents rather than merely responds to contamination.

Our proposal will call for the setting of groundwater quality standards which are based not only on human health considerations but also on environmental impacts. These standards should be set so as to prevent any adverse health effects on water users, and they should function to assure that surface water quality is maintained. And in addition to individual standards for particular contaminants, we would recommend a generic standard for total synthetic organic contamination to provide a margin of safety against potential additive or synergistic health risks associated with multiple chemical combinations.

Again, while initial imposition of source controls should not be dependent upon the detection of a groundwater contaminant, the detection of selected percentages of the groundwater standards should be used to trigger appropriate investigation and response actions to address groundwater discharges. In this way, detection of contamination at trigger levels may result in enhanced controls applied at a particular site or across an entire category of sources. Different detections may call for differing degrees of response under such a program, but in no case should regulatory officials be allowed to simply watch a concentration level rise to meet a standard before possible mitigating measures are explored and implemented. Standards then become enforceable -- not obstacles to enforcement.

Finally, we must set aside the false notion that the states will succeed in protecting groundwater without significant Federal involvement. In our view, it is time -- or past time -- for the Federal government to assert its rightful role in the protection of the natural resource which we share with citizens in all states and with future generations. Afterall, as the National Agricultural Chemicals Association has pointed out in a recent report on pesticide contamination in Iowa, "groundwater flow is not restricted by state boundaries."

Thus, the role of the Federal government with regard to groundwater should be one similar to its widely-accepted role in other resource protection areas. We believe that if we are going to develop and implement groundwater programs that have some hope of being effective, of providing equal protection for citizens from Minnesota to Mississippi, of lessening the likelihood of "pollution havens" in economically depressed states, and of leaving future generations with a clean water supply, then we must place the Federal government in a leadership role. There must be a Federal "gorilla in the closet."

Some have called for "a new Federal-state partnership" for groundwater protection, and we join that call enthusiastically if it means a concerted effort to streamline and improve upon the relationship of Federal and state partners in environmental programs. But if this "new partnership" terminology is simply used to relegate the Federal government to a total backseat position in this partnership, then the our coalition of groups must strongly oppose it.

We agree that the states -- and the local governments as well -- have an important role in groundwater protection, but to those who would argue that groundwater protection duties should be placed solely and exclusively with the states, we must ask: What is it that gives the public any confidence that the groundwater situation will improve? After all, the states have had the authority to act, and the contamination problems that have now finally driven us toward this national debate have happened, as it were, on their watch.

Mr. Chairman, we would again remind the Committee that it has taken a long time to understand that we have a problem which merits some action. Perhaps ever since the days of the Ohio Supreme Court decision which declared groundwater mysterious, occult and beyond regulation, our nation has clung to erroneous notions that groundwater is immune from contamination. When we began finding cases of contamination, we altered our notions only slightly and concluded that they must be isolated instances. These so-called isolated instances now have cost us a great deal not only in terms of cleanup dollars but also -- and perhaps more importantly -- in needlessly squandered public trust.

While we see no sense now in deploring what we haven't done, we also see no sense in delay. We urge the members of Congress to set out a range of options for action, including ones based on the principles I have outlined today. We ask that you act with haste to scrutinize those options and then to choose the most effective, equitable and expeditious means of protecting the nation's groundwater. Clearly, this Committee is moving toward that end, and the Environmental Policy Institute is pleased to see the introduction of legislation such as S. 1105, S. 2091 and S. 2092. Speaking on behalf of the Institute now, I would like to offer the members of this Committee our perspective on the various groundwater bills that have been introduced to date.

S. 20, as you well know, was introduced by members of this Committee at the outset of this session of Congress, and EPI viewed that action as an important step in pressing the issue of groundwater protection forward in the minds of the public and the Congress. To that end, we heartily commend the cosponsors of the legislation. We do not, however, believe that S. 20 either, in its current form or probably in an amended form, would serve to compel that types of groundwater protection solutions that are so urgently needed.

Our differences with the substance of S. 20 may be obvious from my earlier comments, but let me point out specifically a few of the fundamental problems we have with the bill.

First, in the declaration of policy under the bill, S. 20 might be read to endorse a protection of groundwater "uses" rather than protection of the groundwater resource itself. This is not -- as I hope I have already conveyed -- an esoteric or unimportant distinction. We do not believe that, either from a technical, scientific angle or from an institutional perspective, we have the capability to successfully relegate some groundwater to a public sewer function and at the same time preserve other groundwater for drinking. If, on the other hand, the language of S. 20 was intended to say that all uses of groundwater -- both today and in the future -- deserve protection and that the most sensitive needs will take precedence over others, then we agree with the bill's authors but ask for a fuller clarification on this point.

Second, a major underpinning for the groundwater protection that might emerge from S. 20 rests with the groundwater quality criteria by the Environmental Protection Agency. As I stated before, we believe that numerical standards do have a place in a groundwater protection scheme. We would also concur with the notion that EPA should take the lead in researching and developing numerical water quality criteria. However, we do not believe that standard-setting should be relied upon as the centerpiece for protection, and it appears to us that the major thrust of S. 20 is a standard-setting program. Indeed, the sole requirement for the state groundwater protection programs called for in S. 20 is that compliance with these standards is achieved. That, in our view, is just not adequate. The fundamental approach which we believe is the key to actually making progress against groundwater contamination is one which gets right to the heart of the problem -- with source controls to mitigate and hopefully eliminate many groundwater pollutant discharges.

In addition, we are greatly troubled that S. 20 cuts Federal authority just short of what is needed for standard-setting in any case: While the bill calls for EPA to develop groundwater quality criteria, it allows the states to "utilize" those criteria basically as they see fit. Thus, there is no minimum Federal floor of protection provided under S. 20's standard-setting provisions.

S. 20 does specifically name several sources of groundwater contamination which are of "national concern", and here we agree in part. Solid and hazardous waste disposal, underground storage tanks and pipes, subsurface sewage disposal, pesticide use, and underground injection of wastes do present problems of "national concern." Other activities, such as mining, oil and gas production, fertilizer use, feedlot operations, to name a few, give us clear cause for national concern as well. Thus, we believe an effective groundwater bill will have to be far more ambitious in terms of the sources it addresses. In addition, we would argue that any scheme in which the states are key actors must provide for sources of state and local concern to be addressed as well. In fact, those pollution sources which are concentrated in particular areas of the country may well be the sources for which the states will require the biggest push for action from the Federal level.

Finally on S. 20, we would argue that Federal approval and oversight is sorely underused. We urge any legislation to call for thorough review of state program proposals by EPA, clear oversight authorities, and duties for EPA to review and, if necessary, take over implementation of state programs which are inadequate.

A second bill which several members of this Committee have cosponsored is S. 1105, a provision dealing exclusively with research and data collection needs. EPI is happy to offer a strong endorsement of this legislation as an amendment to broader regulatory bill. While EPI did comment favorably on some of the research components embodied in H.R. 791, we would clearly choose S. 1105 as the superior vehicle for accelerated and focused research, demonstration and technology transfer.

EPI believes that S. 1105 offers a carefully considered approach to accelerating and enhancing Federal research efforts related to groundwater protection and remediation. This bill recognizes -- as did the bill which emerged from the House -- that several Federal agencies, namely the Environmental Protection Agency, the U.S. Geological Survey and the Department of Agriculture, have legitimate and important roles to play in this research effort. S. 1105, in contrast to H.R. 791 however, is clear in stating that no new research authority or mandate of any of these Agencies may override the statutory requirements of RCRA, Superfund or other important environmental laws.

S. 1105 also recognizes the need for research not only to better characterize the state of the nation's groundwater resources but also to develop, determine or foster the means of protecting groundwater from particular sources of pollution. We think that this is perhaps the strongest feature of this bill, but we realize that it is just this point which seems to irk some critics of the bill.

As I have listened to some of these criticisms, I am reminded of a groundwater hearing that this Committee held several years back. At that hearing, as I recall, the now Chairman of this Committee, Senator Burdick, pressed EPA for answers to what was being done by the Federal government to develop alternatives to leaching pesticides. Again, as I recollect, the Senator seemed a bit frustrated that EPA kept speaking to what it had done or planned to do to better characterize the extent of the problem of pesticides in groundwater but really couldn't say much about what options would be recommended to farmers.

That particular exchange happened, as I said, several years and many groundwater hearings ago. Still, the Senator may find no better answers to his questions today. With implementation of the research agenda envisioned in S. 1105, however, those answers might be forthcoming, because S. 1105 appropriately directs the Agencies to look for solutions as well as problems. That is an important aspect of this bill and one we urge you to retain against any criticisms you may hear.

In addition to that general comment, we would also offer a few specific suggestions for improvement.

First, in Section 103 which deals with research and demonstration projects related to control technologies or practices, we would recommend that you consider language which provides for the annual solicitation of projects by EPA to be based upon priorities identified in the previously released annual report for the Groundwater Research Committee (Section 102). This, in our view, would be preferable to the case-by-case selection of projects based on the "likelihood of groundwater contamination." Also related to the project selection criteria, we would suggest that it may not be reasonable to necessarily rule out all projects in which the researcher is not him or herself capable of disseminating project results.

This section of S. 1105, as well as many other sections, reflect a strong and appropriate interest in the transfer and sharing of technology and information. We concur with this focus, and in that respect would also suggest that you reconsider limiting such projects to fully "unproven" practices or techniques. It may often be appropriate for projects to be funded which simply help promote the use of a proven but nonetheless sparsely used technique or practice.

Section 104 of this bill provides a much-needed focus on health and environmental effects of various toxic substances, but in addition to the chemical-by-chemical research, you may also wish to consider research and study programs related to chemical combinations that are frequently encountered in the real world. Also in this section, we believe that it is fully appropriate for either direct research or funding of research by the manufacturers and importers of various chemicals, but we do recommend that there be clear language which establishes EPA's authorities to review, oversee or verify research programs and results conducted by such parties. In addition, we recommend that EPA be required, not just permitted, to recoup research costs from these parties.

Section 106 requires assessments of sources of contamination, and we applaud the bill's authors for including notification requirements in this section related to both public drinking water systems and private well users. EPI agrees that every attempt should be made to keep private well data confidential, but we would urge that EPA be allowed to share such information with the appropriate states -- who would then be better informed and hopefully in a better position to help protect their own citizens. It is our understanding that this type of groundrule is being followed for the National Pesticide Survey and that no private well owner has opted out of the survey based on concern about state access to data.

Finally, I would like to comment very briefly on the most recently introduced groundwater bills, S. 2091 and S. 2092. Those bills, in our view, incorporate most fully the basic principles which I outlined earlier as key to long-term groundwater protection, and we heartily commend Senators Durenberger, Baucus, Chafee and Stafford for introduction of the most far-reaching and most promising proposals for national groundwater protection. Clearly, those bills are ambitious and they well draw some criticism. But we would strongly urge all the members of this Committee to carefully consider and debate the specifics of those bills and to use those bills as the vehicles for moving forward in national groundwater protection legislation.

S. 2092, in particular, will no doubt be subject to considerable controversy, since it calls for raising considerable revenue. But to those who argue that we cannot afford to have the Federal government protect our groundwater, we urge a close consideration of the costs of not doing so. A decision to delay a Federal prevention program is, in effect, a decision to subsidize today's pollution at the cost of future generations. And as one writer has noted, "...this type of subsidy is even more dangerous than the monetary kind...." The danger of this sort of subsidy is great, warns that writer, "...because it is paid in a currency that is not replaceable...." In this case, the lost currency will be the nation's clean water.

Again, I thank you for this opportunity to share our views. We commend the Chairmen of both Subcommittees represented here today as well as other Members of Congress who have pressed this issue to the forefront, and we look forward to working with you to enhance the level of protection afforded to the nation's groundwater resources. I would be happy to answer any questions that the Members may have.

CMA

CHEMICAL MANUFACTURERS ASSOCIATION

Written

Statement

of the

Chemical Manufacturers Association

Before the

Subcommittee on Water Resources, Transportation & Infrastructure

and

Subcommittee on Hazardous Wastes and Toxic Substances

of the

Committee on Environment and Public Works

of the

United States Senate

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2501 M Street, NW • Washington, DC 20037 • Telephone 202/887-1100 • Telex 89617 (CMA WSH)

I. Introduction

CMA is a nonprofit trade association whose members represent more than 90 percent of the productive capacity for basic industrial chemicals in this country. CMA member companies use groundwater for several purposes and are subject to many federal, state, and local groundwater management or regulatory programs. As a result, CMA has a major interest in protecting groundwater and in the governmental programs that affect groundwater. We appreciate this opportunity to share our thoughts on S.20, the Groundwater Protection Act of 1987; S.1105, the Groundwater Research Act of 1987; and H.R. 791, the National Groundwater Research Act of 1987, which passed the House of Representatives in December and was referred to this Committee.

Groundwater is a critical natural resource. Its varied uses include agricultural irrigation and stock watering, industrial processing and cooling, and drinking water. To ensure its many beneficial uses, the management and protection of groundwater quality and quantity must be a high national priority.

CMA commends this Committee for its work on groundwater issues. In particular, CMA commends the efforts of Senator Moynihan in introducing and sponsoring legislation that raises important questions about the respective roles of the state and federal governments in groundwater protection and depletion issues. In tackling these difficult questions, the legislative history of the groundwater research bill (H.R. 791) that emerged as a compromise among five separate Committees in the House last year, is instructive. The House bill properly recognizes the primary role of the states in protecting and managing groundwater as a resource. It also recognizes the needs of the states for certain technical, research, and financial assistance from the federal government in order to more effectively fulfill these groundwater responsibilities. CMA supports H.R. 791 and believes it will meet the technical and research needs of the states. In contrast, CMA does not believe that S. 1105 addresses these state needs.

The third bill before this Committee, S. 20, rather than addressing technical and research support for the states, establishes a federal framework for state groundwater standards, planning, and protection programs. While the Chemical Manufacturers Association believes every state should have a comprehensive groundwater protection and management program, we do not believe there is a need for federal legislation prescribing a framework for such state programs. However, if this Committee decides that a federal framework is needed, CMA has suggestions for the Committee in addressing issues raised by this legislation. We will discuss these suggestions in this statement.

II. General Observations: The Groundwater Resource and State Primacy

In deciding how best to protect our nation's groundwater resources, it is essential that the Committee initially recognize three key concepts. First, not all groundwater is used nor is usable as drinking water. There are many beneficial uses of this resource, in addition to human consumption, that warrant protection.

Second, while several federal statutes already control certain sources of groundwater contamination deemed to pose a problem nationwide (e.g. RCRA, CERCLA, CWA and FIFRA), or regulate the quality of drinking water (e.g. SDWA), there is no federal statute regulating groundwater from the broader resource perspective. The legislation discussed in this statement similarly does not propose to regulate groundwater from a resource perspective.

This is for a very good reason and constitutes the third key concept that this Committee must recognize: for both legal and technical reasons, states have and should continue to have primary responsibility for managing and protecting their groundwater resources. States have had primary jurisdiction over groundwater as a result of the evolution of state common law, state water resource management law, and state land use management law. In addition, the nature of groundwater provides a technical, practical basis for continuing state primary responsibility for groundwater. For example, the resource varies in quality, quantity, and potential for contamination according to hydrogeologic conditions that vary across the country. Groundwater also differs according to the behavior of contaminants, both naturally occurring and anthropogenic, moving through these varying hydrogeologic conditions. The potential sources of groundwater contamination encompass all of man's activities, though certain sources of contamination may not be present in all parts of the country. The uses of groundwater range widely and may differ from locale to locale. Finally, the generally slow-moving nature of groundwater means that when contamination occurs it usually affects discrete, local areas.

In sum, the groundwater resource and the potential impacts on it are local in nature and hence more conducive to state/local management.

Nonetheless, federal support of state groundwater programs is needed. Two of the bills currently before this committee, H.R. 791 and S. 1105, propose to support state groundwater protection programs with federal research and development and technical assistance. The third bill, S. 20, would require states to develop groundwater programs according to a specified federal framework. The remainder of this statement will discuss these three bills in the context of two broad questions. First, what do the states need to better manage and protect groundwater? Second, what, if anything, should Congress do to encourage states to see that their groundwater resources are protected? This discussion will incorporate comparisons of these bills, what CMA sees as the more reasonable approach(es), and other suggestions for the Committee to consider.

III. What Do the States Need?

The most logical way to determine the needs of the states in their groundwater efforts is to ask the states. This could be accomplished by soliciting from the Governor of each state information on their groundwater program needs and on key policy issues. Interstate and regional water administrators have already been asked this question. In the August 1987 survey of the Interstate Conference on Water Policy (ICWP -- an independent, national association of state, interstate, and regional water administrators), an overwhelming majority of respondents suggested that stronger federal legislation was needed in the areas of technical assistance, research and development, and funding assistance for existing programs." (p. 16 of survey).

During the debate held in the House on H.R. 791, we also heard that the states needed groundwater quality criteria that they could use to develop groundwater standards. Currently, no authority exists to develop these criteria. There was also much discussion about the need to ensure coordination of all federal research since so many federal agencies are involved in groundwater research efforts. Each of these identified needs is addressed in one or more of the bills currently before you. We will discuss each need in turn.

A. Groundwater Quality Criteria

Groundwater quality criteria are technical tools needed by states to help them develop groundwater standards as they deem appropriate. The concept of criteria is addressed at length in both H.R. 791 and in S.20. (It is referred to as risk assessment analyses in H.R. 791 but the concept is the same.) While these provisions are similar, it is CMA's belief that the House provision (section 207) more accurately reflects what the states need than the S.20 provision (section 4). It recognizes the need for prioritization by requiring these criteria/analyses for significant groundwater contaminants; it more completely sets forth the type of information needed in these criteria; and it requires peer review of the criteria documents as well as public notice and comment on them prior to publication.

In contrast to both these bills, Section 104 of S. 1105 deals with criteria almost as an afterthought. Section 104 would require health and environmental effects research on contaminants known to occur in groundwater, from which criteria documents would be developed. The focus of section 104 is on the health and environmental effects research and testing programs and requirements, rather than on the content of the criteria documents. This focus is misplaced, particularly since authority already exists under both TSCA and CERCLA to conduct equivalent health and environmental effects research (see discussion below).

In these criteria documents, states need information about more than the health effects of a contaminant. They need the most recent scientific knowledge about the physical, chemical, biological, and radiological properties of the contaminant on human health and the environment; information about factors such as occurrence, exposure, sources, aquifer conditions, and groundwater uses which may influence the effects of the contaminant; a description of the relative risks of the contaminant with respect to other risks; and weight of the evidence determinations. States need this information in a format they can use to derive groundwater protection standards.

CMA suggests that in addressing the criteria/risk assessment analyses needs of the states that this Committee follow the approach in H.R. 791. This will ensure that criteria/risk assessment analyses provide usable, accurate and scientifically credible sources of information on the risks posed by significant groundwater contaminants which states can use to develop groundwater standards, where appropriate.

In addition, CMA suggests that the committee not begin the selection of contaminants for which criteria are to be established with mandated lists from other statutory authorities. Instead, CMA urges the Committee to authorize development of a selection procedure that reflects the concept of risk assessment, by directing the Administrator to consider: (1) whether there is a potential for a contaminant to occur in groundwater; (2) whether there is a potential for adverse effects from the contaminant; and (3) whether there is a potential for exposure to the contaminant. This approach to selection would enable the Environmental Protection Agency (EPA) to focus its limited resources on those significant contaminants of concern.

B. Research, Development, and Demonstration

Groundwater contamination is a difficult problem, one that can only be solved by improving our understanding of the groundwater resource and all the impacts on it. To assist the states in their protection, management, and remediation efforts, the federal government should also step up its ongoing research with respect to the sources, causes, effects, extent, prevention, detection, remediation, monitoring, and mitigation of groundwater contamination. Some of this research is already taking place under authorities such as RCRA and CERCLA, but more should be done.

H.R. 791 provides authority to conduct this research as well as authority to establish a demonstration and development program for technologies to prevent, detect, monitor, remediate and mitigate contamination. Under the House bill, EPA would take the lead on this issue, with direction from an interagency research committee on groundwater and peer review by EPA's Science Advisory Board.

In contrast to the House bill's research focus on the larger picture of groundwater contamination, S. 1105 directs much of its authority at establishing a new health and environmental effects research program that duplicates existing research efforts under TSCA Sections 4, 5, and 8 and CERCLA Section 104(i) as well as numerous other statutes. Even beyond the duplicative nature of the research required under Section 104 is its creation of a new regulatory scheme by which EPA can require manufacturers and importers of chemical substances listed as groundwater contaminants, to undertake extensive health and environmental effects research and testing of these substances. We believe the existing structure under TSCA for conducting needed testing is better and should be used. This new, but duplicative authority that would be granted to EPA under Section 104, does not address the needs of the states and for this reason, should be struck from the bill. In its place, CMA suggests that this Committee focus its attention on the criteria provision discussed above.

CMA also prefers a more flexible approach to targeting areas of research, as in H.R. 791, in contrast to mandating specific studies, as in sections 101 and 401 of S. 1105. In particular, CMA suggests that Congress establish a federal interagency research committee on groundwater to make decisions about what specific studies are needed at the federal, state, and local levels.

C. Information and Technical Assistance

When states identify the need for informational and technical assistance, they are in part addressing their need for a better understanding of the groundwater resource. This is essential to an understanding of both groundwater contamination and depletion. In response to this need, H.R. 791 establishes a groundwater assessment program (Section 205) within the U.S. Geological Survey, the purposes of which are to determine the location, hydrogeological properties, quantity, quality, and rates of depletion of groundwater resources in the United States. In addition to assisting state and local governments in their assessment, classification, management, protection, and remediation efforts, this program is also intended to provide information and recommendations about protocols and quality controls; to assist federal and state agencies in meeting their data collection responsibilities under the SDWA, CERCLA, RCRA, and FIFRA;

and to improve the knowledge and understanding about the nature, extent, and causes of groundwater contamination and depletion.

While some of these efforts have been ongoing under existing federal (USGS) and state cooperative programs, this provision would expand the scope and focus of those efforts as they relate to groundwater. In sharp contrast to the assessment program provision in H.R. 791, S. 1105 again aims for the wrong target. Rather than acknowledging the state's need for a better understanding of the resource, Section 106 of S. 1105 requires the federal government to conduct a series of nationwide assessments of categories of sources of contamination. Yet sources of groundwater contamination vary from state to state and location to location within a state. Since states are ultimately responsible for regulating existing and potential sources of groundwater contamination, (outside of those covered under specific federal laws) it is CMA's position that assessment of which sources require special controls or regulations is a judgment that should be left to the states.

This section reveals what appears to be S. 1105's underlying but unstated goal: to establish a framework for a future federal groundwater regulatory program of source controls. As we have already suggested, a federal regulatory program governing groundwater is inappropriate given the essentially local nature of groundwater and groundwater contamination; it would usurp the state's primary jurisdiction over groundwater; and it is not what the states need to protect this resource.

Both H.R. 791 and S. 1105 do respond to an informational need identified by many states: establishment of a clearinghouse for dissemination of groundwater quality information. S. 1105 would locate this clearinghouse within EPA. CMA wholeheartedly supports the clearinghouse function but believes USGS would be a more appropriate repository, since this is a function traditionally carried out by USGS and because the Survey, unlike EPA, is unencumbered by regulatory duties.

Both the House and Senate research bills also contain more general technical assistance provisions. CMA generally supports the concept of Section 103 of S. 1105, authorizing a research and demonstration program on practices and or technologies that may be effective in controlling sources of groundwater contamination. Related to this provision, however, is the patent policy provision at Section 404 which does not reflect current trends in patent policy to permit government contractors to retain title to their inventions. The Government Patent Policy Act of 1980 and a related Presidential memorandum encourage the vesting of title in the contractor for inventions made under federally funded contracts. This trend reflects two goals: to encourage innovation among government contractors and to assure the highest quality work. CMA suggests that a provision reflecting this policy should replace Section 404.

Section 208 of H.R. 791 also contains a separate section on technical assistance, training, and technology transfer designed to assist federal, state, and local governments in all their activities authorized by the bill. CMA would like to point out that in this provision, the House was sensitive to the possible tension between the efforts of USGS and EPA and so specified the generic areas of activities for each. USGS will take the lead on technical assistance relating to groundwater assessment and EPA will take the lead on assistance relating to source controls, mitigation of groundwater contamination, remediation and health and environmental effects. This provision appropriately ensures coordination of the groundwater activities of federal agencies.

D. Management and Coordination of Federal Agencies' Activities in Groundwater

The uses of and potential impacts on groundwater are so broad that a multitude of federal agencies are already involved to varying degrees in research activities relating to groundwater. These activities have evolved as a result of many different statutory authorities. A few of the more prominent agencies involved in groundwater research include: EPA, the Department of Interior (USGS), the Department of Agriculture, the Department of Health and Human Services, and the Food and Drug Administration.

The downsides to having so many agencies involved in groundwater research are at least twofold. First, agencies may be duplicating research efforts without knowing this is occurring; and second, real research needs may not be addressed by any agency, because of the lack of communication between these agencies and other entities that use the research, e.g., the states.

To correct these pitfalls, the House in H.R. 791 approved establishment of an interagency groundwater research committee to ensure coordination of the groundwater research activities of all federal agencies. In addition, this committee is authorized to set priorities for areas of research after soliciting the advice of state and local governments and other persons.

Section 403 of S. 1105 requires the President to coordinate research efforts, but falls short of ensuring coordination because it doesn't mandate establishment of an entity to bring it about, e.g., an interagency committee. It is CMA's belief that an interagency groundwater research management committee should be included in S. 1105 to review the research, development, and demonstration activities of each agency; to determine the usefulness and effectiveness of these activities; and to identify priorities and eliminate any duplication among research programs. This Committee should also ask the states what they need to fulfill their groundwater protection management responsibilities. This improvement to S. 1105 would greatly enhance its effectiveness as a research bill.

F. Summary

The needs of the states for research, technical assistance, and limited financial assistance in their groundwater protection efforts should be met. CMA believes that H.R. 791 is a better reflection of the states' research and technical assistance needs than S. 1105; in particular its provisions for groundwater quality criteria and establishment of an interagency research committee. In contrast, S. 1105 lays the foundation for future imposition of a wholly inappropriate federal regulatory program for groundwater while doing little to support state groundwater management programs. We have highlighted the problems with S. 1105 that reveal this fundamental error in focus. We hope our comments will give this Committee cause to examine S. 1105's underlying goal and ultimate effect and to reject it in favor of a research bill that supports state groundwater efforts.

IV. What Should Congress Do to Encourage States To Protect Their Groundwater Resources

While the debate in the House on H.R. 791 will help this Committee ascertain the research, technical, and financial assistance needs of the states in their groundwater programs, the Senate appears poised to leave its own mark with respect to the second question. What, if anything, should Congress do to encourage states to protect their groundwater resources? It is the Senate's answer to this second question that will determine the balance of federal and state roles in groundwater, so it is a question to which close attention must be paid. It is also a question on which CMA urges the Committee to solicit the views of the Governor of each state.

Senator Moynihan's introduction of S. 20 marked the starting point of this debate. The assumption behind S. 20 is that not all states are adequately addressing groundwater protection questions; therefore, Congress needs to force recalcitrant states down this road. To this end, the bill requires states to develop groundwater programs according to a specified framework. If a state implements the provisions of S. 20 "satisfactorily" it can obtain federal grants for its groundwater programs. Immediately, this arrangement raises several questions. First, are the assumptions behind the bill correct: that states aren't doing enough; that states need a federal framework to do more; and that a federal framework with federal grants tied to its implementation would encourage states to improve their groundwater protection efforts? Second, whether or not one accepts the assumptions behind S. 20, is the federal framework outlined in the bill the appropriate model that would lead to improvements in state groundwater efforts or are there problems with it?

A. Assumptions behind S. 20

At the outset, CMA questions the need for federal legislation establishing a federal framework for state groundwater management programs. Many states are already addressing groundwater problems through implementation of state groundwater quality standards programs, programs to detect, correct or prevent groundwater contamination from different sources, and through development of groundwater management strategies, protection programs, and classification systems.

The Office of Technology Assessment reported in its 1984 study, Protecting the Nation's Groundwater from Contamination, that 31 states had existing groundwater quality standards programs (20 of which were specific to groundwater as opposed to combined surface water and groundwater programs) and 12 states were at that time developing standards programs specific to groundwater. In the five years since that study was published there has been an increase in both legislative and regulatory activities in groundwater at the state level. The Association of State and Interstate Water Pollution Control Administrators recently testified before this Committee that it had learned, in response to its recent groundwater questionnaire, that 98% of states use permits to control discharges to groundwater; 77% of the states had comprehensive groundwater quality regulatory systems or protective strategies in place; and that the remaining 23% will have such systems or strategies in place before the end of 1988.

We believe that the assumption behind S. 20, that the states are not doing enough when it comes to groundwater, is questionable. In part, the perception is there because past practices, no longer tolerated under either federal or state laws and regulations, are producing today's stories of groundwater contamination -- and the resulting sense that not enough is being done. The fact is that in recent years there has been a proliferation of both federal and state programs designed to protect groundwater from contamination. These programs cannot produce immediate results given the nature of the problem of contamination but they are certain to have ever-increasing positive effects as time goes on.

If one assumes, however, that the states are not doing enough, is a federal framework what the states need to encourage them to improve their groundwater programs?

The federal framework under S. 20 sets out what appear to be logical components of a state groundwater program: assessment of the groundwater resource; development of a management strategy; development of a monitoring program; establishment of standards; and development of a protection program. While some states have instituted groundwater programs with all of these elements, most states have only instituted some of these. In particular, most states have focused their groundwater efforts on the establishment and use of health based standards. Often their application of these standards is arbitrary and without regard to vulnerability of the resource and uses of the resource beyond drinking water. The S. 20 framework rightfully acknowledges that groundwater standards are only one piece of any rational approach to the protection of the resource. The question at hand, however, is not whether these elements are logical components of a state program. The question is, whether a framework for states to adopt is what states need to protect their groundwater or to improve their existing groundwater protection efforts and whether such a framework would serve to encourage them to do so.

CMA continues to assert that states do not need a federal framework because the states are already instituting groundwater programs tailored to their specific state's groundwater needs. While a federal framework might ensure a comprehensive approach to groundwater in all states, it does not encourage states to improve their efforts. It simply mandates states to perform Congressionally-selected activities. Those few states that have not instituted any groundwater programs or that have not instituted programs beyond standards programs have not yet identified a need for a program or lack sufficient funding or technical expertise to develop such programs. It is CMA's position that states should first be given the tools and opportunity to develop comprehensive programs of their own through financial assistance, research, and technical assistance from the federal government. This assistance would encourage them to develop and improve their groundwater programs. A federal mandate of the content of state groundwater programs, before states have been provided the resources and assistance they need to assess conditions in their states and to develop appropriate programs on their own, prematurely inserts federal decisionmaking into what is in essence a state and local issue.

B. The S. 20 Framework

While CMA does not support the need for federal groundwater legislation going beyond research, technical, and financial assistance, we recognize that this type of legislation might occur. If after learning more about the groundwater needs and policies of the states, this Committee determines that there is a need for a federal groundwater program and embarks on a course to adopt a federal framework similar to S. 20, CMA has many suggestions for making this framework both more acceptable from a state primacy perspective and more effective. Some of these suggestions follow.

As a preliminary matter, CMA questions the need for a national policy statement on groundwater even though CMA believes that groundwater should be managed as a resource, in a manner that recognizes its wide variations in use, vulnerability, and quality. To the extent this Committee decides a policy goal is appropriate, we would urge adoption of a goal that focuses on the protection of groundwater for all beneficial uses. The declaration of policy in S. 20 reflects a variation on the concept of protection for multiple uses of the resource. Such an approach is infinitely superior to an unrealistic and unachievable nondegradation policy.

1. Groundwater Protection Standards

Section 5 of S. 20, requiring states to establish groundwater standards for contaminants found in ambient groundwater, is unnecessarily restrictive of the states' decisionmaking responsibilities under their own groundwater management and protection programs. By mandating uniform application of ambient water quality standards except for specially designated groundwater systems, the states are deprived of their ability to develop methods for applying standards that are better suited to their local groundwater conditions.

For example, some states may wish to classify their groundwaters based upon their determination of differences in use of the groundwater, the particular vulnerability of the groundwater, and the different qualities of the groundwater. Once a state classifies its groundwater, it would likely apply standards on the basis of its classification system. The method established in S. 20 could undermine a state's use of an alternative classification system since the bill only recognizes one approach to application of standards. This should be modified and the concept of classification should be acknowledged because it is founded in a tenet basic to this whole discussion: not all groundwater is used or is usable as drinking water and not all groundwater should be protected as drinking water. It is CMA's position that this tenet should be reflected not only in this section of the bill but in all federal programs affecting groundwater.

Section 5 imposes application of primary drinking water standards everywhere except where special systems have been identified. Besides depriving the states of their ability to set and apply standards as they determine are needed, this provision imposes drinking water standards in the ground or aquifer when they are intended under the Safe Drinking Water Act to be imposed at the point of use and after opportunity for treatment. The application of these standards to all groundwater, even groundwater not used and without potential to be used for drinking water, would be an inappropriate use of these health based standards.

2. Groundwater Assessment

Section 6 of S. 20 requires the states to develop an assessment of groundwater resources within each state, using guidance from the U.S. Geological Survey. Groundwater assessment is often a critical first step in any state or local effort to protect and manage groundwater resources and to identify goals and objectives of those resources. Assessment activities include providing any necessary information on groundwater which allows for the classification of groundwater, to the extent states find such management useful.

CMA supports the concept in section 6 of having states assess groundwater resources to the extent a state finds this necessary but CMA warns against the creation of a narrow, prescriptive assessment program. Federal guidance often takes on the form of a prescriptive mandate that states are pressured into adopting. The potential for such misuse of federal guidance is apparent in Section 6(b) of S. 20, where the USGS is to outline in federal guidance the details required in groundwater assessments to be conducted by states. To remedy this potential problem, this section should be modified to suggest that USGS provide assistance to the states with respect to groundwater assessments. If such assistance takes on the form of federal guidance, states should be allowed to use or reject it as they deem appropriate.

3. Groundwater Protection Program

Federal guidance as to the design, structure, and format of state groundwater protection programs may also lead to a prescriptive mandate, effectively imposing federal decisionmaking on state protection programs. The potential for over-prescription by way of federal guidance is apparent in Section 9(a) of the bill. Again, given state primary jurisdiction over this issue, the states' use of federal guidance should be qualified.

More importantly, EPA should not assume the role of assessor of the content of state groundwater protection programs. Although there must be some accountability for the federal grants made to the states under this bill, assessment of a state program should be conducted by the state through a series of public hearings, public comment, and state certification to the Administrator that all the provisions of S. 20 are being implemented. Any programmatic assessment by EPA of the content adequacy of state programs should not occur except as is required to fulfill the need for federal accountability.

4. Grants

The standard by which federal grants decisions will be made, under Section 10 of the bill, is not clearly expressed in the phrase "implementing satisfactorily." CMA opposes federal approval of the program content of state groundwater protection and management programs because this could involve the federal government second guessing the state on a programmatic issue that is under the state's primary jurisdiction. Rather than imposing federal programmatic review to determine eligibility for federal grants, CMA suggests that eligibility be determined on the basis of a schedule of implementation and/or state certification following public hearings and comment.

These suggestions for improving the framework outlined in S. 20 are not all-inclusive. CMA has many other suggestions for injecting greater flexibility within the content of the framework and for removing federal overprescription from the bill. We would be happy to share these thoughts with your staff at their convenience.

C. Conclusion

While CMA cannot support the need for a federal framework for state groundwater programs, if the Committee determines, based on its review of state programs and needs that additional steps are appropriate, we recommend the Committee identify those steps for which a broad consensus could readily be reached. Some of the components of S. 20 that have counterpart supporting provisions in H.R. 791 may serve that purpose. For example, the resource assessment component of Section 6 of S. 20 would be supported by the assessment programs activities of Section 205 of H.R. 791. Section 6 of S. 20 would also provide the foundation for establishing the management strategies of Section 7 which are among the first steps that must be taken in developing any groundwater program. All of H.R. 791 could work to support these efforts. Similarly, the monitoring program component in Section 8 would be supported by technical assistance under Section 208 of H.R. 791.

If in its deliberations the Committee decides a federal framework is needed, we would urge the Committee to walk carefully through the question of federal overprescription of the content of state groundwater programs, while simultaneously keeping its eye on its ultimate goal: encouraging states to take sufficient measures to protect their groundwater. This goal should not be implemented in such a way that states are driven away from addressing specific state priorities and needs with respect to their groundwater. The Committee should also keep in mind practical considerations. What can the states do and what should be done now? Finally, we would urge the Committee to provide a mechanism by which states that have existing groundwater programs not be shackled with new federal requirements under any federal framework.

This testimony has not addressed the omnibus bill recently introduced by Senator Durenberger. Implicit in CMA's position that states do not need a federal framework is the position that CMA does not support the need for an even more comprehensive federal groundwater regulatory program, such as that proposed in the Durenberger bill. While we have not had an opportunity to complete our analysis of this bill, we are confident of our opposition to it. We would like to share our thoughts with the Committee on this bill at a future date.

We hope these remarks have provided some useful suggestions and insights in better helping states address groundwater protection. We would be happy to provide this Committee with any further assistance.

Chemical Manufacturers Association's
Responses to
Groundwater Questionnaire

1. Is there a need for federal groundwater legislation or are other federal statutes adequately addressing this need?

CMA sees no need for comprehensive federal groundwater legislation because groundwater protection is currently being addressed by an appropriate combination of existing federal and state statutes and programs. States have primary responsibility for management and protection of the groundwater resource, and they should continue to do so because they are better equipped to deal with groundwater's variation in use, vulnerability, and quality.

Existing federal statutes, including Comprehensive Environmental Response, Compensation & Liability Act (CERCLA), Resource Conservation & Recovery Act (RCRA), Clean Water Act (CWA), and Safe Drinking Water Act (SDWA), regulate sources of groundwater contamination deemed to be of national significance. These statutes adequately address problems caused by these sources. Sources not covered by these statutes, but that are of particular concern to individual states, may be regulated under state law aimed at protecting the resource. Source identification and control may be a part of any state-developed groundwater management strategy.

Federal legislation increasing federal research, technical assistance, and financial assistance for state groundwater efforts is needed. We support federal legislation that provides this assistance to the states.

1(a) Would a federal statute weaken other existing federal programs for groundwater?

A federal statute providing research and technical assistance to the states would not weaken any existing federal programs related to groundwater. Such a statute can only strengthen existing programs.

On the other hand, a federal statute that sets forth a comprehensive regulatory program in groundwater could weaken existing federal programs because of the likelihood that it would create yet another approach to groundwater protection, likely to be inconsistent with existing programs' approaches.

A comprehensive federal groundwater statute could also weaken existing state groundwater programs because it could redirect state resources away from priority issues identified by states in their groundwater management strategies.

1(b) What efforts could be made to integrate and strengthen all these statutes?

EPA's groundwater management strategy should serve as a decision-making component in implementing all federal programs affecting groundwater. Rather than create another layer of federal regulation to integrate those other statutes, we believe EPA needs to aggressively implement this strategy. In particular, we believe EPA needs to incorporate its principle of differential protection in all federal programs affecting groundwater. This would ensure that all federal groundwater activities acknowledge differences in use, vulnerability, and quality of the groundwater. Not only would this approach help coordinate existing federal activities, it would also focus EPA's efforts on areas of the most importance.

In addition, CMA believes that federal statutory program efforts that have been delegated to the states would be strengthened at the state level if state groundwater management strategies are considered during implementation of federal programs.

2. Should the primary responsibility for groundwater management reside with state and local governments or should there be a national goal set by the federal government?

Primary responsibility for groundwater management should continue to reside with state and local governments for both legal and technical reasons. States have primary jurisdiction over the groundwater resource as a result of the evolution of state common law, state water resource management law, and state land use management law. In addition, the nature of groundwater and the impacts on it provide a practical basis for continuing the states' primary jurisdiction. Groundwater's variability in quality, quantity, accessibility, and potential for contamination makes it more conducive to state and local management. The potential sources of contamination vary across the country. The uses of groundwater also differ from locale to locale. When contamination occurs, it generally affects discrete, local areas. Taken together, all of these facts persuasively argue for continuing primary responsibility for groundwater management and protection at the state and local level.

Whether there should be a national goal for groundwater, set by the federal government, instead of state/local primary responsibility, is not an either/or choice. A national goal need not be inconsistent with state primacy in groundwater resource management. For example, an alternative national goal could be the protection of groundwater for all its beneficial uses. If a national goal is realistic, achievable, and flexible enough to permit individual state approaches to groundwater protection, it can be consistent with state primary responsibility for groundwater.

2(a) If there is to be a national goal, which agency should set it and what should it be?

A national goal should probably be set by Congress rather than by any federal agency. If there is to be a national goal, it should be realistic, achievable, and flexible. Therefore, it should probably urge that groundwater be protected for all its beneficial uses. Such a goal would encourage protection of groundwater that's used or has the potential to be used as drinking water to levels protective of human health. Simultaneously, it would recognize that not all groundwater is used or is usable as drinking water. For groundwater that's not used or usable as drinking water, it should be protected for those other uses -- some of which might not require human health standards. This goal would encourage states to ensure the highest level of protection for groundwater used for drinking water but would also encourage states to assure its continued availability for other multiple beneficial uses (e.g. agricultural irrigation, stock watering, industrial process and cooling water).

2(b) Should there be a strict federal nondegradation policy, a limited one, or should states decide on nondegradation?

A strict, federal non-degradation goal would be unrealistic, unachievable, misleading to the public, and wholly inappropriate. Given the nature of groundwater and all of man's impacts on it, such a goal implicitly calls for a cessation of all of man's activities. Any federal policy goal should be realistic and achievable to avoid contributing to growing public cynicism and distrust of government institutions and laws. A nondegradation goal would also usurp the states' primary responsibility for groundwater protection by mandating this one approach to protection of groundwater. It would permit no flexibility in state approaches to groundwater protection.

The purpose behind a nondegradation goal is to protect all groundwater to levels protective of human health, not just groundwater that is used or usable as drinking water. A similar purpose, protection of current or potential drinking water, can be achieved by a more realistic approach that recognizes the facts: not all groundwater is used or is usable as drinking water.

Finally, a nondegradation goal perpetrates unnecessarily divisive relations among federal, state, and local governments, the regulated community, environmental activists, and everyday citizens by defining the problem of groundwater protection too simplistically. The question is not whether groundwater contamination should be prevented. The question is how best to protect it for all its uses. This is a question better left to states given the generally local nature of the resource. Some states have and will continue to set nondegradation goals. How these states are interpreting and implementing these goals, however, is usually more realistic. States should be given flexibility to set and implement groundwater goals that reflect their particular groundwater protection problems and solutions.

3. Do you support federal groundwater permits based on water quality criteria or federal source controls based on potential for groundwater contamination?

Neither federal permits nor federal source controls for groundwater (outside of those already existing federal controls for sources of national significance) are proper tools for the federal government to use to protect groundwater. Outside of existing federal controls, protection of groundwater from additional sources of contamination is and should continue to be a state function, given states' primary jurisdiction over groundwater quality and quantity. CMA believes that the states should develop their own groundwater management strategies based on conditions in their individual states. States should assess both their groundwater resource and the sources of contamination significant in their states. States should also develop protection programs that may include groundwater standards. These standards may be enforced through permit systems and/or source control systems or any other system deemed effective by a state. In effect, CMA supports states instituting comprehensive groundwater management and protection programs, and we support programs that protect the multiple uses of groundwater -- not just drinking water. Whether a state institutes permit systems or point source control systems or another form of enforcement is a state decision because protection and management of the groundwater resource is a state responsibility. The federal government should neither institute additional federal permits nor federal source controls. Especially, it should not mandate specific state groundwater protection enforcement activities.

4. How should the activities of federal agencies be coordinated -- by a committee designated by statute, a statutorily designated lead agency or should this be the responsibility of the President?

CMA believes the President should appoint an Interagency Groundwater Research Committee to oversee and coordinate the activities of the federal government with respect to groundwater research. CMA does not believe that any existing entity under its current set-up effectively fulfills this coordinating function. At a minimum, the committee should include representatives from those federal agencies and departments with current responsibility for groundwater (EPA, DOI, USDA) and health related research (DHHS, FDA, NIH). Among these, CMA supports EPA and DOI (USGS) taking co-chair positions. Lead agency determinations should not be made on the basis of functions in regulation and research. Rather, these determinations should be made according to generic areas of research expertise -- e.g. USGS on resource assessment issues; EPA on mitigation of groundwater contamination; DHHS and ATSDR on health effects issues, etc.

5. Role of various federal agency activities:

a) approving state plans for assessment, monitoring, protection or management:

For federal grant accountability purposes only, EPA should review a state's implementation of its own groundwater management plans and a state's own certification of its plan's adequacy based on state public comment and hearings. EPA should not assess a state program's adequacy or content; rather, EPA should award grants based on certification that the state is implementing its plan based on a state-developed implementation plan and schedule.

b) USGS: providing technical assistance (especially to the states) on matters of hydrogeology, resource assessment, resource management, mapping of aquifers or recharge areas, or data management.

c) EPA/ATSDR: providing technical assistance on matters of health effects (ATSDR/EPA); criteria setting (ATSDR/EPA); mitigation strategies (EPA); or remediation strategies (EPA).

d) USGS: operating an information clearinghouse providing indexing of data, of literature (technical and lay) and of sources of expert advice and service to state and local governments.

e) USGS: conducting research on hydrology, hydrogeology, fate and transport of chemicals on the subsurface, monitoring network design, analysis of the vulnerability of groundwater to contamination.

Where needed, USGS should solicit assistance from research institutes and industry on chemical-specific issues.

f) EPA/USDA/DOI/DOE: conducting research and development on techniques for preventing contamination from: agriculture (USDA/EPA); domestic waste disposal (EPA); industry (EPA/DOI/DOE).

g) DHHS (ATSDR/NIH): conducting research on health and ecological effects of contaminants.

Where needed, these agencies should solicit assistance from NAS and should contract some of this work to research institutes.

h) EPA: conducting research and development on methods of remediation and treatment of contaminated groundwater. Where needed, EPA should contract work to research institutes.

i) EPA/DHHS: issuing health advisories. Assuming this is a regulatory function, EPA should issue these based on research and recommendations of DHHS (ATSDR).

j) USGS: should conduct groundwater resource assessments and should provide technical assistance to states, upon request, concerning resource assessments. This might be achieved, in part, under the existing state/USGS cooperative program.

ENDNOTE: Funding for all these federal activities should come from general revenues.

6. How should the needed university research and educational programs related to groundwater be strengthened and how should these be administered?

   No comment

7. Comment on the USGS National Water Quality Assessment Program and how that relates to any of the assessments and studies in S. 20, S. 1105 and H.R. 791.

   No comment

8. Comment on EPA's classification scheme and how it relates to each of the 3 bills.

a) S. 1105 includes no resource assessment provision and therefore does not address EPA's classification scheme.

b) H.R. 791 includes an assessment program provision (Section 208) that would assist state and local governments in their groundwater classification efforts. This provision, then, could promote implementation of EPA's classification scheme at the state level.

c) S. 20's policy objective reflects the desirability of protecting different sources of groundwater differently, based on their quality, vulnerability, and uses. This same objective is reflected in EPA's differential protection (or classification) principle. S. 20's approach to classification of groundwater is not as fully developed as EPA's approach, however. It merely provides one framework for states to adopt for setting and applying standards. This framework recognizes different uses of groundwater, but it does not define different classes of groundwater and how these should be differently protected as EPA's classification scheme does. Rather than be required to adopt either the S. 20 approach or the EPA classification approach, CMA believes states should be allowed to use either or to adopt a completely different approach to groundwater management and classification. Whatever approach a state adopts should be one that is based on conditions in the state.

9. To what extent should the federal government concern itself with groundwater depletion -- research only? regulation?

The federal government should concern itself with groundwater depletion in a research capacity and then only as quantity issues relate to quality issues. Water quantity is an issue historically and most appropriately left with the states. There is a body of state water resource law stretching back to the beginning of this nation that addresses these issues. Institutions and procedures have evolved from this body of law in each state to implement these laws. Any federal involvement in it, beyond research, is neither necessary nor appropriate because it is an issue peculiarly local in nature.

10. To what degree are states using land use controls to prevent groundwater contamination?

    No comment

11. Given limited fiscal resources, what are the priority programs and activities to fund in these bills?

(1) technical assistance to the states relating to resource assessment, monitoring, sampling, and analytical protocols.

(2) criteria from which states can develop groundwater standards.

(3) financial assistance to the states to help them develop state groundwater management programs.

12. Point out any exemplary state groundwater programs or add any other comments not covered in your statement.

    No comment

Testimony of

AL GIESE
Vice President, Plant Food
Cenex/Land O'Lakes Ag Service
on behalf of
THE FERTILIZER INSTITUTE
before the

Subcommittee on Water Resources
Transportation and Infrastructure
and the
Subcommittee on Hazardous Waste and
Toxic Substance
of the
Senate Committee on Environment & Public Works
March 24, 1988

The Fertilizer Institute
1015 18th Street, N.W., Washington, D. C. 20036
202-861-4900 Telex 89-2699

I am pleased to be here today representing the fertilizer industry, which shares your concerns about groundwater quality. Groundwater is a vital natural resource, serving as a source of drinking water for more than half our population and for about 95 percent of the rural population in the U.S.

We are here today to discuss the role and the responsibility of American agriculture to help assure groundwater quality. We in agriculture fully recognize the need to strike a balance -- an agri-balance, if you will -- between the need for a highly efficient food production system and the need to mitigate any adverse impact on groundwater and the environment from agricultural practices. We in the fertilizer industry are dedicated to achieve the necessary environmental balance in agricultural production.

Today I will limit my comments to the plant nutrient nitrogen. Of the nutrients supplied in fertilizers, it is the only one that is sufficiently soluble to be mobile in soil water which can percolate into groundwater. Phosphorus, very unlike nitrogen, reacts very quickly with soil constituents and reverts to insoluble forms. With only rare exceptions is it mobile in soil water. Essentially the same applies to potassium and other nutrients in commercial fertilizers. And, before I continue, I want to emphasize that nitrate is not a pesticide. All too often fertilizer and pesticides are believed to be the same. In reality -- the two products bear no similarities.

Now, back to nitrogen: in a sense, we live in a nitrogen environment. The air we breath is 75 percent nitrogen. Air over each acre of the Earth's surface has approximately 35,000 tons of nitrogen. Rainwater may add 7 to 8 pounds of nitrogen to the soil per acre per year. And, according to The Fertilizer Handbook, the plow layer of most soils has a nitrogen content ranging from 0.08 to 0.4 percent. With a representative average of 0.15 percent, an acre of soil to a six-inch depth contains a nitrogen reserve (mainly organic) of 3,000 pounds (1.5 tons). Many soils of the Midwest will contain three tons of nitrogen per acre in the plow layer. However, over the course of a growing season, a crop may remove only two to three percent of this organic nitrogen from the plow layer. Thus, the organic nitrogen reserves of soil could supply as much as 20 to 80 pounds per acre to a crop in one year. Continued crop removal without replacement quickly reduces a soil's capacity to supply nitrogen, thus the need for nitrogen to supplement natural supplies. If we take corn, for example, a 150-bushel per acre crop will require approximately 170 pounds of nitrogen per acre. The general rule of thumb is 1.1 to 1.2 pounds of nitrogen per acre per bushel. For wheat, the general rule is 1.6 pounds of nitrogen per acre per bushel.

According to R. D. Hauck, Agricultural Research Service, Tennessee Valley Authority, approximately 9.2 to 10.8 million tons of N are returned to cropland via manures, crop residues, rainfall and biological fixation. This, however, does not meet the annual U. S. need for nitrogen on farms to produce our demand for protein. Thus, about 10 million tons of nitrogen are applied to cropland through the use of commercial fertilizer. Other sources that contribute nitrogen to the environment are geological deposits, forests, pastures, urban wastes and septic tanks.

Once placed in the soil, nitrogen from whatever source is subject to transformation that takes place in the "nitrogen cycle." These transformations include:

- Immobilization - biological assimilation of nitrate (NO_3-) and ammonium (NH_4+) to form organic compounds.

- Mineralization - the opposite of immobilization.

- Nitrification - the biological oxidation immobile ammonia NH_4+ to nitrite (NO_2-) and nitrate (NO_3-).

- Denitrification - the transformation of nitrate (NO_3-) to nitrogen gas (N_2).

There is little known about the rates and timing of these various transformations occurring within the nitrogen cycle.

However, once nitrogen in the soil is transformed into the nitrate form (NO_3-) it is soluble in and can move with soil water. Soil water can percolate down through the root zone and eventually becomes part of groundwater.

Nitrate accumulating in groundwater is a longstanding concern. Since the turn of the century, the U.S. Public Health Service (U.S.PHS) drinking water standard for nitrate is 10 parts nitrate-N per million (mg/L). This standard was established because of the threat of methemoglobinemia in infants by higher levels. This condition results from nitrites (produced in the body from nitrates) reacting with lemoglobin and reducing its capacity to carry oxygen in the blood stream. Occurrence of the condition today is rare. However, according to EPA's publication "Nitrogenous Compounds in the Environment" (EPA - SAB 73-001) published in 1973, Minnesota experienced 139 cases of methemoglobinemia and 14 deaths, attributed to high nitrate levels in farm wells from January 1947 to the Summer of 1949 -- a period prior to significant use of nitrogen fertilizer in that state. Also, a survey of 732 farm wells in Iowa in 1939 revealed that 27 percent of them were above the 10 ppm limit of nitrate N. Only insignificant amounts of nitrogen had been used in Iowa prior to that time.

In a more current 1984 survey of water analysis for nearly 124,000 wells across the U.S., the data showed that 80.4 percent of the wells had a nitrite-N concentration below 3.0 parts per million and 13.2 percent had a concentration between 3.1 and 10 ppm. About 6.4 percent had a concentration exceeding 10 ppm.

Obviously, there are very large quantities of nitrogen in the environment. It is, however, those quantities used in crop production that have drawn the most attention over the last several years in the groundwater debate.

Based on U.S. Department of Agriculture figures for 1987-88 (July 1987 to June 1988) U.S. farmers will use 10.4 million tons of nitrogen from commercial fertilizer. That equates to 68 pounds of nitrogen per acre on 305 million acres of cropland. Application rates of nitrogen on selected U.S. field crops are listed in Table 1.

In 1987, about 74 million acres of farmland were idled under two provisions of the 1985 farm bill: the conservation reserve program (CRP) to remove erodible land from production; and the crop set-aside program that qualifies farmers for government price supports. Generally it is the least productive lands that are removed from production by government programs. While planted corn acreage declined by 14 percent in 1987, per acre nitrogen application rates remained unchanged from 1986.

TABLE 1

Fertilizer use on selected U.S. field crops 1/

Crop, year	Acres receiving				Application rates		
	Any fertilizer	N	P_2O_5	K_2O	N	P_2O_5	K_2O
	Percent				Pounds per acre		
Corn for grain:							
1983	96	97	88	83	137	64	85
1984	97	97	87	82	138	65	87
1985	98	97	86	79	140	60	84
1986	96	95	84	76	132	61	80
1987	96	96	83	75	132	61	85
Cotton:							
1983	68	68	44	30	81	45	52
1984	77	76	48	32	81	48	53
1985	76	76	50	34	80	46	52
1986	80	80	50	39	77	44	50
1987	76	76	47	33	82	44	45
Soybeans:							
1983	33	20	30	32	18	45	70
1984	34	20	30	32	17	46	72
1985	32	17	28	30	15	43	72
1986	33	18	29	31	15	43	71
1987	30	15	25	28	20	47	75
All wheat:							
1983	73	72	48	20	60	39	48
1984	76	76	49	17	62	37	46
1985	77	77	48	16	60	35	36
1986	79	79	48	19	60	36	44
1987	80	80	50	15	62	35	43
Sorghum 2/:							
1987	85	85	47	17	79	37	40

1/ Detail for selected States by crop are found in appendix tables 3 through 7. 2/ Data for sorghum not available for 1983-86.

If one compares commercial nitrogen application rates to other sources, it might surprise many to learn that an alfalfa crop can add 100 to 150 pounds of nitrogen to the soil per acre per year. Also, soybeans can add 60 to 100 pounds of nitrogen per acre to the soil. In 1987 U.S. farmers planted 59 million acres of soybeans. In addition, if livestock manure were used to substitute for commercial nitrogen, it would require over 26 tons of manure applied per acre to achieve the average crop production from 132 pounds of commercial nitrogen.

Modern agriculture systems still have some severe limitations imposed by nature -- limitations that must be recognized by all of us concerned with groundwater quality.

First, the nitrogen cycle is not leak-proof. With an element as versatile and as mobile as nitrogen, it surely will be present in varying degrees in nature's universal solvent: water. Indeed, nitrate levels above 10 ppm were found in groundwater as early as 1939, long before agriculture's demand for nitrogen for crop production increased sharply.

Second, despite the tremendous strides made for improving efficiency, we still depend upon root systems which occupy no more than 1 percent of the soil volume, and plants that use 400-500 pounds of water per pound of dry matter produced. Thus, there is no complete recovery of applied or biologically fixed nitrogen. Major grain crops typically recover 50-70 percent of applied nitrogen. Other crops such as spinach, lettuce and strawberries, with very limited root systems, seldom recover much more than 20-25 percent of the applied nitrogen. Thus, as long as we want to produce food, there will be a large requirement of nitrogen for the production of these crops.

Moreover, regardless of the source of this required nitrogen (i.e. manure, legume crop rotation or commercial nitrogen) there will continue to be losses within the nitrogen cycle to the environment until we design a plant that can do a much better job of recovering nutrients from the soil.

The leadership of the U.S. fertilizer industry has faced these facts and others regarding the use of nutrients supplied in commercial fertilizers for food production and their fate in the environment. In December 1985, I testified on behalf of The Fertilizer Institute before the Subcommittee on Toxic Substances and Oversight of this committee and outlined the positive programs our industry initiated to encourage practices that minimize losses of applied nutrients to the environment. The fertilizer industry has a long and consistent record of supporting farmers in improving their management of nutrients in crop production.

Agriculture has a responsibility to utilize practices that maximize recovery of nutrients in the soil. The question for agriculture today and at this hearing is how agriculture fits into the groundwater debate. This debate was well framed by the questions we were asked to address at this hearing. Certainly we could not improve on the comments of EPA submitted before the subcommittee on February 23, 1988. We will, therefore, leave the global discussion on groundwater to those more learned than we and we will keep our comments specific to what we know best -- agriculture.

First, agriculture does not need regulation, it needs information. Information that will help farmers manage the nitrogen they use for crop production. Since 95 percent of rural drinking water supplies come from groundwater, farmers have the most to gain by adopting management practices that mitigate any adverse impact to groundwater -- and the most to lose by ignoring sound management practices. We believe that given the information, farmers are quickly aiming for an agri-balance approach to crop production. Farmers want to achieve efficient, economic, optimum production while at the same time safeguarding the environment, and, with information on best management practices they can achieve both maximum economic yields and maximum environmental advantage. We do not think it is coincidental that per acre nitrogen application rates remain the same while per-acre production is increasing; it merely reflects management on the part of farmers.

Recognizing the fact that information is key, the fertilizer industry supports the Agriculture Nitrogen Best Management Practices Act of 1987 which was incorporated in Title III, Section 304 of the House-passed groundwater bill, H.R. 791. If adopted, USDA will establish a task force to further develop and improve BMPs for nitrogen management. Farmers must have this information in order to remain efficient as well as to provide sound stewardship of their natural resources.

In the Senate, 22 Senators support this concept, embodied in S. 1767. We applaud their recognition of the need for development and implementaiton of BMPs in agriculture. We would hope that any Senate-groundwater legislation will include S. 1767.

For our part, the fertilizer industry is not waiting on the adoption of this legislation. For decades we have been strong advocates of best management practices -- practices like soil testing to determine optimum rates of nutrient application to match specific needs of soils and crops. Soil testing has long been one of the foremost BMPs for plant nutrient use and judicious application of fertilizer. We support BMPs even though it has reduced fertilizer use. TFI's latest effort to promote BMPs is the development of a public service video which urges farmers and agribusinesses to adopt the agri-balance commitment of efficient production and environmental protection.

Second, diversity is the rule with regards to agriculture's role in groundwater. Even in a single state, there are extremely wide ranges of conditions, including precipitation, geology, soil type, and other factors that affect groundwater. These factors dictate the quantities of elements, such as nitrate, entering groundwater but also greatly affect the rate at which they may be transported within the soil. We simply see no way any single piece of legislation could address the nearly infinite number of combinations of conditions to best manage nutrients in the environment. However, adoption of site-specific BMPs could respond appropriately to each agricultural concern by state, by county or by farm.

Further research is needed to improve our knowledge of BMPs. We would recommend designating USDA's research arm, the Agricultural Research Service (ARS), to not only increase our knowledge of how agricultural activities are impacting agriculture, but also in identifying practices in agriculture that will identify nutrient loss. ARS has just identified six high priority areas of research that will result in technologies that will add to our BMP list to minimize leaching of nitrate from agricultural land to groundwater while maintaining the competitiveness of U.S. agriculture. A copy of ARS's strategic groundwater plan for nitrates is attached. (Retained in committee files.)

Further, the 1985 farm bill contained provisions that will have an impact on groundwater quality. Farmers, by 1990, must have a conservation plan and have it in place by 1995. Further, USDA will have 45 million acres in the Conservation Reserve Program by 1990. These acres represent agriculture's most fragile and less productive land. These two programs, combined with increased adoption of BMPs, will have a major impact in improving groundwater conditions from agricultural practices.

Helping farmers understand that they have the greatest potential impact on water quality should be our government's primary emphasis. That means education. It means changing the way we do things.

Government should help get this message to our food producers -- people who want to remain efficient, profitable and prudent managers of their farming operation.

This is our challenge in agriculture. The fertilizer industry has long demonstrated its commitment to the task -- and pledges its continued commitment for the future well-being of our customers and of the nation as a whole.

Thank you.

TFI is a voluntary, non-profit association whose members represent approximately 95 percent of the domestic fertilizer production in the United States. TFI's membership includes: producers, manufacturers, traders, retail dealers and distributors of fertilizer materials. Its members are major shippers, receivers, and exporters of fertilizer and fertilizer materials and are a vital link in the nation's agriculture system.

Working for the Nature of Tomorrow.
NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, N.W., Washington, D.C. 20036-2266 (202) 797-6800

STATEMENT OF
ERIK D. OLSON, COUNSEL,
ACCOMPANIED BY
DR. GERALD V. POJE, ENVIRONMENTAL TOXICOLOGIST,
ENVIRONMENTAL QUALITY DIVISION,
OF THE
NATIONAL WILDLIFE FEDERATION

JOINT HEARINGS ON GROUNDWATER LEGISLATION,

BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES, TRANSPORTATION, AND INFRASTRUCTURE
AND THE
SUBCOMMITTEE ON HAZARDOUS WASTES AND TOXIC SUBSTANCES
OF THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

100th CONGRESS, SECOND SESSION

MARCH 24, 1988

Good morning, I am Erik D. Olson, Counsel for the Environmental Quality Division at the National Wildlife Federation. I am accompanied this morning by Dr. Gerald V. Poje, the Environmental Quality Division's Environmental Toxicologist. The Federation is the nation's largest citizen conservation organization, with over five million members and supporters nationwide, and with affiliated organizations in 49 states plus

Puerto Rico and the Virgin Islands. We thank the Subcommittees for inviting the Federation to testify on the important issue of groundwater, and for the opportunity to discuss several groundwater regulatory and research bills now before the Senate Environment and Public Works Committee ("the Committee").

The National Wildlife Federation commends Senators Durenberger, Baucus, Chafee, and Stafford for introducing S. 2091 and S. 2092, the best comprehensive national groundwater protection legislation introduced to date. While we believe that legislation still has a few gaps and rough spots that will need to be addressed, we urge this Committee to use S. 2091 and S. 2092 as a vehicle for moving the debate on groundwater protection legislation forward.

We also commend the sponsors of S. 20, an earlier bill introduced to get the debate on groundwater legislation moving. We agree that each of the elements for a state groundwater protection program required in S. 20 is important and needed, including groundwater standards, individual source controls for groundwater pollution sources of "national concern." We conclude, however, that section 9 of S. 20 has too vague and skeletal a description of the necessary components of a state program. As drafted, the bill cannot assure the rigorous and meaningful review of state groundwater programs that is necessary to protect human health and the environment from groundwater pollution. The bill also has no provision to require sluggish states to move forward with protecting groundwater, and includes provisions that inadvertently would weaken existing law, including the Resource Conservation and Recovery Act and Superfund. Since S. 20 has now served its original purpose to get the national groundwater legislation debate moving, we urge that S. 2091 and S. 2092 now be used to focus the Congress's attention on the specifics of groundwater protection legislation that need to be addressed.

In addition, we support S. 1105, the groundwater research legislation before the Committee. We urge the Committee, however, to recognize that while further research is needed, multi-year research programs must not be used as an excuse to avoid comprehensive groundwater protection legislation that is needed to address directly today's problems. Finally, we urge the Committee to support and to work for swift enactment of S. 1419, legislation that directly addresses the significant national problem posed by pesticides in groundwater.

I. INTRODUCTION AND OVERVIEW.

A. Groundwater Pollution: A National Problem.

At a previous Senate hearing, it was argued that:

> The effect of this [legislation], if enacted in its present form, is to shoulder aside local, state, and multi-state efforts to deal with the [pollution] problems....This...is, at best premature, in our judgment. The control of...pollution is best handled at the state and local level because it involves a weighing of many interests which local officials are most competent to evaluate. The states and local governments must be given a fair chance to deal with it....
>
> In short, just as the states are getting together to solve their local joint problems, the Federal Government now threatens to apply a heavy hand. It is submitted that this problem is not so critical as to remove it from local and state governments that are now alert to the need for prompt and effective action, and which are now acting.[1]

This testimony was delivered to the Senate Public Works Committee over twenty years ago, when opponents of federal clean air legislation were arguing that clean air was a local concern, and that the federal government should keep its nose out of states' business. With the leadership of Senator Muskie and others from that Committee, Congress rejected these arguments, and took steps to protect the American public from air pollution by enacting comprehensive federal clean air legislation.

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[1] Statement of Orville V. Bergen, Illinois Manufacturers Association, in Air Pollution--1967 (Air Quality Act): Hearings Before the Subcommittee on Air and Water Pollution of the Committee on Public Works, United States Senate, on S. 780 and Related Matters Pertaining to the Prevention and Control of Air Pollution, 90th Cong., 1st Sess., Part 3 at 2167-68 (1967).

Today, we hear the same time-worn arguments in the groundwater context. We are told that somehow groundwater pollution is a uniquely local problem, that we should not burden industry or states with a new federal law that tells them to protect the nation's citizens from polluted groundwater, that the *status quo* is just fine. Today, however, we all should know better.

Groundwater pollution has emerged as a public health and environmental issue of the first magnitude. Groundwater provides about half of the nation's population with its drinking water. Over 95 percent of rural residents use groundwater for drinking water. Yet groundwater is polluted across the nation by a wide variety of chemicals and pathogens. The Environmental Protection Agency (EPA) recently released figures showing that according to public health records, from 1971-1985 *over 52,000 people have become ill in outbreaks of disease or poisoning due to drinking contaminated groundwater*.[2] EPA says that due to underreporting of outbreaks and illnesses, the actual number of illnesses in outbreaks of disease may be *twenty five times larger*.[3] The number of chronic illnesses and latent diseases, such as cancer, caused by polluted groundwater has yet to be determined on a national level. But we do know that groundwater in every state is polluted with a cornucopia of organic and inorganic pollutants. Many of these chemicals are suspected of causing an array of health problems, including birth defects, reproductive failure, suppression of the immune system, or cancer.[4] Tragically, South Dakota officials have reported that high levels of nitrates in groundwater used for baby formula killed an infant in that state recently.[5]

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[2] U.S. EPA, Proposed National Primary Drinking Water Regulations; Total Coliforms. 52 Fed. Reg. 42,226 (Nov. 3, 1987).

[3] U.S. EPA, Proposed National Primary Drinking Water Regulations; Filtration and Disinfection. 52 Fed. Reg. 42,183 (Nov. 3, 1987).

Moreover, groundwater pollution problems can become surface water pollution problems, because nearly a third of the flow of the nation's surface water comes from groundwater, and in many surface streams all of the flow originates from groundwater during droughts. Sensitive aquatic ecosystems in surface wetlands and streams, therefore, can be harmed by groundwater pollution, as can the unique subterranean ecosystems that are fed by groundwater in some regions.

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[4] See, e.g., Office of Technology Assessment, Protecting the Nation's Groundwater From Contamination, vol. 1 at 23-36 (1984); National Academy of Sciences, National Research Council, Drinking Water and Health series (1977-1987).

[5] Water Information Center, Groundwater Newsletter, vol.15 no. 18 at 1 (Sept. 30, 1986); see also, Busch and Meyer, A Case of Infantile Methemoglobinemia in South Dakota, J. of Environmental Health, v. 44., at 310-11 (May/June 1982)(reporting previous nitrate in groundwater related infant poisoning, treated before death resulted, in South Dakota).

B. *The Federal Approach to Date: Penny Wise and Pound Foolish*?

Each year, the federal government and private parties spend *billions* of dollars *cleaning up* our past mistakes. Congress had enacted Superfund, with a ten-year trust fund in excess of ten billion dollars. Under the liability provisions in Superfund and the Resource Conservation and Recovery Act (RCRA), the government and private parties will spend many times that amount.[6] The General Accounting Office (GAO) recently estimated that there are as many as 425,000 Superfund sites may exist across the country that may need clean up.[7] At a Superfund site, removal costs of $2 million, plus $20 million or more in longer-term remedial costs are not unusual, and the costs of actions to assure adequate health protection may be substantially higher.[8] At one site in Colorado known as the Rocky Mountain Arsenal, the Federal government estimates that total clean up costs and natural resource damages exceed $1.8 billion; state estimates are even higher. United States v. Shell Oil Co., No. 83-2379 (D. Colo.). Again, the General Accounting Office tells us that the total costs to taxpayers for cleaning up toxic waste dumps on federal lands will be in the billions of dollars, with clean up on public lands and at private sites extending well into the 21st Century.[9]

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[6] *See, e.g.*, GAO, *Hazardous Waste: Corrective Action Cleanups Will Take Years to Complete*, at 22 & note 2 (GAO/RCED-88-48) (Dec. 1987)(estimates that RCRA corrective action may cost up to $22.7 billion, and notes that Superfund cleanup costs may cost up to $39.1 billion for up to 4,200 sites.)

[7] GAO, *Superfund: Extent of the Nation's Potential Hazardous Waste Problem Still Unknown*, at 3 (GAO/RCED-88-44 (Dec. 1987).

Of course, waste site clean ups are very important, and are necessary to assure that public health and the environment are not threatened by these toxic sites. But we are spending little on preventing the very same problems from recurring in the future: as a nation, we are penny wise, and pound foolish.

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[8] See, e.g., Cole and Walsh, Superfund 1987: Public Health Remains at Risk--A One Year Report on EPA's Cleanup Program Under the New Superfund Law (Clean Water Action Project and U.S. Public Interest Research Group, Nov. 1987); EPA, Superfund: A Six-Year Perspective, (October, 1986); White et al., Summary of Hazardous Waste Treatment at Superfund Sites, Env't Reporter at 1121-29 (Current Developments--Special Report)(BNA)(1987).

[9] See, e.g., GAO, Superfund: Civilian Federal Agencies Slow to Clean Up Hazardous Waste (GAO/RCED-87-153) (July, 1987)(criticizing slow federal agency progress in identifying and cleaning up hazardous waste sites on federal lands); GAO, Hazardous Waste: Corrective Action Cleanups Will Take Years to Complete, at 22 & note 2 (GAO/RCED-88-48) (Dec. 1987)(estimates that RCRA corrective action may cost up to $22.7 billion, and notes that Superfund cleanup costs may cost up to $39.1 billion for up to 4,200 sites.)

Our failure to offer even minimal expenditures for protection of groundwater is highlighted by the Administration's FY 1989 Budget. EPA asks for no money to pay for two very modest groundwater protection programs adopted by Congress in the 1986 Safe Drinking Water Act Amendments: the Wellhead Protection Program and the Critical Aquifer Protection Area program.[10]

It is time for the federal government to recognize that we must now embark on what undoubtedly will be one of the key environmental issues of the 1990's: preventing groundwater pollution.

C. A National Focus on Prevention of Groundwater Pollution.

Will our children and grandchildren, in the year 2025, look back to the late 1980's, and say, "they had a chance then to prevent the devastation of the nation's groundwater, over 90 percent of our fresh water, but they lacked the vision to save this precious resource?" Will they have to ask why, just over 35 years before, the nation recognized the problem and could have prevented the creation of millions of sites of contamination, but lacked the will and courage to act?

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[10] EPA, FY 1989 EPA Justification of Appropriation Estimates for Committee on Appropriations, at DW-37 to -41 (1988).

Many of the greatest leaders in the struggle to protect our public health and the environment have come from the ranks of this Committee. The nation again needs leadership today, to avert a crisis, to prevent a national tragedy while it is still preventable. As a matter of obligation not only to ourselves, but also to generations hence, we must take bold action to prevent the poisoning of the nation's groundwater resources. We must reject the notion that one generation can assign large basins of groundwater for continued pollution, to lie as buried monuments to its lack of vision and greed. As Senators Durenberger, Baucus, Chafee, and Stafford have recognized in introducing S. 2091 and S. 2092, action is needed, and the time to act is now.

II. THE EXTENT OF GROUNDWATER POLLUTION

Groundwater is often polluted from a variety of manmade sources. These include hazardous waste dumps, industrial and municipal landfills, hazardous material handling, storage, and transfer, underground injection wells, excessive or inappropriate application of fertilizer and pesticides, intensive animal husbandry, leaking storage tanks above and underground, faulty septic systems, road salt storage and use, and many other sources.

No comprehensive national groundwater pollution monitoring program exists. While our experience under Superfund and other laws has acquainted us with the many industrial and other point sources of groundwater pollution that dot the nation, there also are many more diffuse and widespread sources. For example, fertilizers and pesticides constitute one of the largest sources of groundwater contamination with direct and indirect impacts on water resources.

U.S. Geological Survey tests of over 120,000 wells across the country, have found that nitrate contamination, often linked to improper fertilizer use or human and animal waste, exceed health levels in wells in 48 states[11]. In Iowa, over 25 percent of private wells tested exceeded health standards for nitrates. Tests by the Minnesota Departments of Health and Agriculture found that 42 percent of 190 private wells, and 12 percent of the 225 public water supplies in Minnesota have nitrate levels in excess of drinking water standards.

EPA has found that at least 22 pesticides contaminate groundwater in 24 states, and that one in every four wells tested in certain agricultural areas are contaminated with pesticides.

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11. Madison, R.J. and J.O. Brunett, "Overview of the Occurrence of Nitrate in Ground Water of the United States," in USGS, National Water Summary 1984, Water Supply Paper 2275 (1985).

The 1987 pilot test of the National Pesticides in Groundwater Survey showed agricultural chemical contamination of 30 of 48 wells sampled across California, Minnesota and Mississippi. While EPA's on-going National Pesticides in Groundwater Survey will expand our national knowledge, many states have conducted more detailed studies of their own groundwater quality.

On Long Island, New York over 2400 wells have been contaminated with the insecticide Aldicarb and its residues[12]. In Florida, more than a thousand wells were condemned because of ethylene dibromide contamination. In Iowa more than 25% of the population using public water supplies receive water that contains pesticides at some time during the year. In Minnesota preliminary monitoring indicates that 38% of 500 water samples contained at least one pesticide.

California has conducted the most extensive survey of agricultural chemical impacts on groundwater supplies.[13] A 1986 study of pesticides in groundwater tested over 8,300 wells for pesticides, with a total of almost 72,000 samples. More than 25% of the wells sampled were contaminated.

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[12] U.S. Environmental Protection Agency, "National Primary Drinking Water Regulations; Synthetic Organic Chemicals, Inorganic Chemicals and Microorganisms; Proposed Rule," Federal Register 50 (219): 46985 (November 13,1985).

[13] State of California, Department of Food and Agriculture, Sampling for Pesticide Residues in California Well Water: 1986 Well Inventory Data Base. Report to the Legislature pursuant to the Pesticide Contamination Prevention Act (1987).

Thus, as we gather more data, it is becoming increasingly clear that contamination of the groundwater by industrial, agricultural, and many other sources, is serious and widespread.

III. GROUNDWATER POLLUTION AND PUBLIC HEALTH

Serious groundwater contamination occurs in every state in the nation, including contamination above safe health levels in many states by synthetic organic chemicals, nitrates, bacteria, viruses, and pathogens, and many other organic and inorganic contaminants.

The overall impacts of groundwater pollution upon public health are difficult to establish with precision. As noted above, while EPA has documented that 52,000 people became acutely ill from drinking contaminated groundwater from 1981-1985,[14] the Agency admits that this number probably underestimates the actual magnitude of acute illnesses substantially.

Chronic diseases such as cancer often are very difficult to link to consumption of environmental contaminants. Preliminary epidemiological studies are just beginning at several sites across the country to determine the full magnitude of the health effects of the dumping of cancer-causing agents, and other toxic chemicals with chronic effects, into our underground water supplies.

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[14] U.S. EPA, Proposed National Primary Drinking Water Regulations; Total Coliforms. 52 Fed. Reg. 42,226 (Nov. 3, 1987).

Cancer and birth-defect-causing chemicals, and even "immunosuppressive" chemicals that weaken the body's defenses against attack by pathogenic bacteria, viruses, and parasites, have been found in the groundwater in virtually every state in which the groundwater has been tested intensively. These organic and inorganic chemicals can come from numerous unregulated or under-regulated sources of groundwater pollution, ranging from unlined industrial pits to leaking storage tanks.

In addition, studies of the potential health effects of agriculturally-related groundwater contamination are just beginning to be completed. Agricultural chemicals have been implicated in acute and chronic diseases and in the specific impairment of major organ systems.[15] Drinking water from wells with elevated nitrate concentrations has resulted in methemoglobinemia, a biochemical impairment of the blood's ability to carry oxygen.[16] Nitrites may serve as essential precursor molecules for the formation of nitrosamines, some of which are potent carcinogens. The epidemiological implications of drinking water contamination with nitrates and nitrites have not been fully evaluated. However, some investigators have expressed concern over increased occurrence of stomach cancer[17] and congenital malformations[18] associated with consumption of nitrate and nitrite contaminated drinking water. Exposures to pesticides have been implicated in chronic illness such as Parkinson's disease[19] and cancer[20] as well.

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[15] S. Murphy, "Pesticides," in Casarett and Doull's Toxicology the Basic Science of Poisons (Macmillan Publishing Co., 1980).

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[16] Infants are particularly susceptible to nitrate poisoning because they have proportionally higher intakes of fluids, their acidic gastrointestinal tracts provide an environment for production of the ultimate toxicant, and their fetal hemoglobin is more sensitive than adult hemoglobin. Busch and Meyer documented a recent case in South Dakota where a six-week-old infant recovered from methemoglobinemia-induced cyanosis (J. Environm. Health, 1982. 44(6):310-311). The Des Moines Register (July 29, 1986, p.1) reported a mortality attributed to nitrate poisoning.

[17] O.M. Jensen, "Nitrate in drinking water and cancer in northern Jutland, Denmark, with special reference to stomach cancer," Ecotoxicol Environ Safety 6: 97-101 (1982).

[18] M. Dorsch, R. Scragg, A. McMichael, P. Baghurst and K. Dyer, "Congenital malformations and maternal drinking water supply in rural South Australia: a case-control study," American Journal of Epidemiology (1984).

[19] R. Lewin, "Parkinson's Disease: an environmental cause?," Science 229: 257-258 (1985).

[20] See, for example: S. Hoar, A. Blair, F. Holmes, C. Boysen, R. Robel, R. Hoover and J. Fraumeni, "Agricultural herbicide use and the risk of lymphoma and soft-tissue sarcoma," Journal of American Medical Association 256(9): 1141-1147 (1986). Also, L. Burmeister, G. Everett, S. Van Lier and P. Isacson, "Selected

Establishing conclusively that chronic human illness is caused by chronic low level exposure to chemicals found in groundwater is extremely complex. Several complicating factors may lead decision-makers to understate substantially the public health significance of current low level contamination with nitrogen fertilizers, pesticides, and other contaminants.

For many carcinogens the time between first exposure and onset of the tumor is usually no less than 15 years and can be as long as several decades. Similar patterns of long latency may occur with other chronic diseases. Given the increasing use of synthetic organic chemicals within the past two decades, present patterns of illness in agricultural and industrial areas may not accurately reflect future patterns of illness.

Second, epidemiological studies are generally insensitive. Our ability to detect relatively rare diseases such as many forms of cancer (e.g., leukemias, liver tumors, soft-tissue sarcomas), depend upon surveying large numbers of people. When epidemiologists aggregate highly vulnerable people and very slightly vulnerable people into a single, large exposure group,

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(Footnote Continued)

cancer mortality and farm practice in Iowa," American Journal of Epidemiology 118(1): 72-77 (1983).

the results tend to show a lower average occurrence of disease than is experienced by the most highly susceptible individuals. Toxicological testing shows that susceptibility to a particular chemical varies: between infants and adults; between men and women; between pregnant and non-pregnant women of child-bearing age; among people of different genetic backgrounds; and between healthy and unhealthy people.

Third, because of inadequate toxicological testing, we simply do not know the full range of adverse health effects caused by many chemicals, including both the active and so-called "inert"[21] pesticide ingredients. For example, some pesticides are known to cause neurological damage, but EPA has not established a protocol for testing all pesticides for these effects. For most pesticide ingredients EPA will not require tests to identify which cause birth defects unless it believes that a large number of women will be exposed. Cancer testing is incomplete for the majority of synthetic organic chemicals, including most pesticides. Furthermore, for the most part, toxicological tests have focused upon single chemicals, and therefore little data is available for assessing the health and safety of chemical mixtures such as pesticide formulations.

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[21] As of April 21, 1987 EPA divided the approximately 1200 "inert" ingredients into four categories: 1. Inerts of Toxicological Concern: 50 chemicals known to be toxic; 2. Potentially Toxic Inerts/ High Priority: 60 inert ingredients which are structurally similar to known toxicants; 3. Inerts of Unknown Toxicity: Approximately 800 ingredients of which EPA has inadequate information to determine toxicity; 4. Inerts of Minimal Concern: 300 inert ingredients that are generally recognized as safe. The lack of available health and safety information betrays our greater inability to assess the toxic hazards of many pesticide formulations.

Fourth, laboratory toxicological data suggesting that exposure to a low level of a chemical is "safe" may be misleading. In the real world people are exposed to several chemicals at once. Increased risks may occur through either simultaneous or sequential exposure to several chemicals. Some interactions may be antagonistic: simultaneous exposure to two chemicals results in lower damage than would be caused by either chemical if administered alone. Other interactions may be synergistic: simultaneous exposure to two chemicals result in greater damage than would be caused by either chemical if administered alone. For the vast majority of chemical combinations, there are no data to describe their interactions.

Fifth, current monitoring captures only a small sample of potential contaminants[22], and present exposure levels may not

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[22] In August, 1987 EPA issued draft health advisories for 50 common pesticides with a high potential for contaminating drinking water. Only 15 (30%) advisories indicated that standard analytical methods and detection limits for the pesticide in water were available. For 7 (14%) pesticide health advisories, no analytical method was available.

Only during the past year has EPA developed methods to detect a significant number of pesticide active ingredients and break-down products. According to EPA's Project Summary, this past year's National Pesticides in Groundwater Survey pilot reflect the past history of exposure. Public water suppliers are not required under EPA's implementation of the Safe Drinking Water Act to monitor for the most widely used organic chemicals. In general, the government does not assess private water well quality. "Inert" ingredients in pesticide formulations are generally claimed as trade secrets, and therefore these chemicals are not sought during monitoring efforts.

In summary, no comfort should be taken from partial monitoring studies which indicate "only low levels" of contamination. Today's exposures may lead to diseases many years from now. Current epidemiological evidence cannot assure the health safety of these levels. Toxicological data are woefully inadequate to provide assurances of safety for any single chemical. Real world exposures will include simultaneous and sequential exposures to a barrage of chemicals. Finally, present methods for measuring agricultural chemicals open only a tiny window to view the world of chemical contamination in the environment.

(Footnote Continued)

tested five new multi-residue methods, which along with two older methods will analyze for the presence of about 120 pesticides (70 "priority pesticides and 50 "non-priority" pesticide chemicals).

Thus, while we know that each year thousands of Americans become acutely ill from drinking contaminated groundwater, the true magnitude of the effects of groundwater on public health has yet to be fully revealed. What we know may be the tip of the iceberg.

IV. CURRENT FEDERAL GROUNDWATER RELATED ACTIVITIES.

A. EPA Activities.

Most of our effort and dollars at the federal level have gone into cleaning up contamination after the fact. The federal government, however, is currently engaged in a variety of groundwater related research, regulatory, and other activities.

At EPA alone, 270 separate groundwater related activities are ongoing, many of them not directly tied to clean up.[23] This existing patchwork of often uncoordinated, poorly managed, and grossly under-funded federal programs, ranges from site-specific technical assistance, to the complex regulatory and permitting schemes for hazardous waste dumps. These programs are not protecting the public's health or the environment adequately;

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[23] EPA Office of Groundwater Protection, "EPA Activities Related to Sources of Ground-Water Contamination," (February 1987).

they have many gaping holes, and often have been extraordinarily ineffective at dealing with the groundwater protection problem.

For example, while EPA actively regulates hazardous waste dumps, the Office of Technology Assessment has identified at least thirty-two other important sources of groundwater contamination, most of which EPA regulates either minimally or leaves completely unregulated. By EPA's calculation, it has "some level of activity" for twenty-five of these categories of sources, and no activity for the other categories of sources, according to a report by EPA's Office of Groundwater Protection.[24] However, a careful review of the twenty-five categories of sources purportedly dealt with by EPA, reveals that EPA and state regulations for many sources are virtually nonexistent.

The EPA Groundwater Office's report states, for example, that there is a "high level" of regulatory activity for "nonhazardous waste" landfills, land application of waste, surface impoundments, and waste piles.[25] A recent EPA study by the Solid Waste and Emergency Response Office that was mandated by the Hazardous and Solid Waste Amendments of 1984[26], however, paints a completely different picture.[27] The data presented in this Solid Waste Office study show that the regulation (if any) of these sources was at best ineffective. Approximately 90 percent of the 16,416 active landfills have no liners to protect the underlying groundwater, and 96 percent have no system to collect the leachate that seeps from the landfill. More than eight out of ten landfills fail even to monitor groundwater, and 60 percent place no restrictions on the waste accepted. More surprisingly, almost 5,000 landfills are not inspected even once a year. Because of loopholes in existing laws, thousands of tons of hazardous waste are disposed of in these landfills.[28]

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[24] Id. at 6.

[25] Id., Exhibit III-2.

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26. These 1984 amendments overhauled the Resource Conservation and Recovery Act (RCRA). Following the completion of the second phase of this study, EPA is to recommend to Congress changes for facilities receiving waste not classified as "hazardous" under EPA rules; EPA also is required to revise its "criteria" for municipal dumps and other facilities receiving household hazardous waste, and hazardous waste from small-quantity generators. See RCRA §4010.

27. EPA Office of Solid Waste and Emergency Response, "Subtitle D Study: Phase 1 Report." (October, 1986).

28. Id. at ES-8 to ES-11.

Another source for which the Groundwater Office at EPA claims there is a "high level" of regulatory activity is surface impoundments. The recent EPA Solid Waste Office study, however, finds that there are over 190,000 surface impoundments, including 17,000 agricultural waste surface impoundments ("known to have high concentrations of nitrates, pesticides, herbicides, and fertilizers"), over 125,000 oil and gas waste impoundments (containing "high concentrations of chloride, total dissolved solids, barium, sodium, and calcium"), over 16,000 industrial surface impoundments, and over 24,000 mining waste surface impoundments. Of these, 71 percent are unlined, and only one percent use a plastic or other synthetic (non-soil) liner. Ninety-nine percent of these impoundments have no leak detection systems, 96 percent have no groundwater monitoring programs, and 73 percent have no restrictions on the waste placed in the impoundment. Sixty percent of the impoundments are not even inspected annually.[29]

The federal record for protection of the groundwater is no better, and sometimes is worse, for other sources of contamination. In short, the existing regulatory mechanisms are inadequate to protect human health and the environment.

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[29] Id. at ES-12 to ES-14.

B. USGS Activities

USGS has numerous authorities, albeit general and vague ones, to conduct research on groundwater quality and quantity. The Survey is not, however, an agency with the experience or expertise to regulate. The USGS has conducted numerous useful studies, summarized periodically in the "National Water Summary" series, of the problems facing groundwater. However, the Survey often is extraordinarily careful to maintain an academic disinclination to involve itself in policy and regulatory disputes. For example, recent press accounts have reported that the USGS fired a geologist merely because he allegedly told local residents without prior USGS approval that they may be in danger of having polluted groundwater from a wood treatment plant. (Exhibit B). Thus, while the Survey certainly is a repository of substantial geohydrologic expertise, it cannot and should not be called upon to make regulatory judgments, or to review the adequacy of the regulatory provisions adopted by states.

V. The Need for Federal Legislation

It is apparent that the efforts of EPA and USGS are not adequately protecting the nation's groundwater resources. In addition, it is now painfully obvious that state and local governments alone cannot adequately protect public health and the environment from groundwater pollution. Aquifers polluted by man's activity often cross local and state boundaries, and therefore the movement of groundwater pollution does not stop at these political boundaries. States seeking to attract or keep industries that may cause groundwater pollution may have the short-term incentive to adopt lax groundwater protection rules in the absence of minimum national groundwater protection requirements.

Although some states have begun to attack groundwater pollution aggressively, many have not. Some states have no plans to adopt comprehensive groundwater pollution protection programs.

While it is true that Congress has adopted the Resource Conservation and Recovery Act, the Hazardous and Solid and Waste Amendments of 1984 ("HSWA"), the Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund") and the Superfund Amendments and Reauthorization Act of 1986, and the Safe Drinking Water Act and that Act's 1986 Amendments, there is an urgent need for coordination of these and other statutes, and an even more urgent need to fill the gaps and weaknesses left by those laws. Major gaps or shortcomings in the existing federal scheme continue to leave our groundwater vulnerable to further pollution.[30] In addition, the Safe Drinking Water Act provides no protection from drinking polluted water to the millions of Americans who get their water from private wells, and EPA generally has failed to use its authority under the Act to protect users of "noncommunity" public water systems, such as wells used to supply water for many restaurants, hospitals, factories, and seasonal resorts or camps.

Although EPA insists that it needs "flexibility," the few bright spots in its groundwater protection program, where actual protections are beginning to come into place, exist in programs where Congress has specifically mandated EPA action. For example, EPA has made some progress in dealing with leaking underground storage tanks and hazardous waste management facilities, both very specifically regulated under RCRA and HSWA in prescriptive federal legislation.

Unfortunately, even in those programs where EPA has specifically been told to protect groundwater it often has failed to do so. In one recent example, Congress told EPA to regulate a set of six microbiological contaminants in public water systems. EPA said it would regulate these contaminants as part of the rule package with a deadline of June, 1988. However, EPA has now proposed, in plain violation of the law, to exempt all groundwater-supplied public water systems from the requirements to kill these pathogenic organisms, including viruses, Heterotrophic Plate Count bacteria, *Giardia*, and the organism that causes Legionnaire's disease.[31] EPA says it may regulate these dangerous contaminants in groundwater-supplied public water systems in 1991. This action was taken despite EPA's admission on the same day that over 52,000 people had become ill from drinking contaminated groundwater from 1971-1985, often due to microbiological contamination.[32]

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[30] These gaps include inadequate or nonexistent controls on: industrial "non-hazardous waste" pits, ponds, lagoons, and landfills; sewage treatment plant lagoons; municipal landfills; mining and mine waste; oil and gas production waste and reserve pits; agricultural sources of pollution such as pesticides, chemical fertilizers, animal feedlots, and chemigation; septic tanks and cesspools; above ground tanks and materials storage and handling facilities; and many other important sources.

Thus, the existing array of state, territorial, local, and federal laws fails to control groundwater pollution from many sources, and often is implemented in an ineffective, uncoordinated and potentially conflicting manner. Consistent

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31. U.S. EPA, Proposed National Primary Drinking Water Regulations; Filtration and Disinfection. 52 Fed. Reg. 42,183 (Nov. 3, 1987).

32. U.S. EPA, Proposed National Primary Drinking Water Regulations; Total Coliforms. 52 Fed. Reg. 42,226 (Nov. 3, 1987).

groundwater sampling protocols, monitoring requirements, and data management requirements are needed. Most importantly, however, we need to assure that every citizen is guaranteed safe drinking water.

The urgent need for federal action to protect the nation's groundwater was recognized by the National Groundwater Policy Forum (NGPF), a blue-ribbon panel of government, industry, academic, and conservationist representatives chaired by former Arizona Governor Bruce Babbitt and vice chaired by NWF President Jay Hair and USX Chief Executive Officer David Roderick. The Forum recommended that a national groundwater policy go far beyond research and coordination of existing programs. It found that groundwater "must be actively managed, not left to *ad hoc* decisionmaking," and "that contamination should be prevented wherever possible because of the technical difficulties and economic costs involved in cleaning up." In addition, the Forum concluded that "degradation of the most valuable aquifers and critical water supplies should be prevented," and "that any national groundwater program must recognize wide variation across the country in the nature, vulnerability, and use of groundwater, as well as the capacity of states and local governments to manage it."[33]

The Forum went on to recommend ten components of an effective groundwater protection program. All of the components the Forum envisioned as being required of states are embodied in S. 2091; many of them are incorporated into S. 20. Similarly, the National Wildlife Federation's Corporate Conservation Council, an organization of high-level corporate officials from some of the largest Fortune 500 firms, has recommended that a national groundwater policy focus on prevention of contamination.[34]

This generation has a responsibility to act as stewards of the nation's groundwater resources, protecting them for use by future generations. We outline below the legislation that is needed to fulfill this responsibility. Much of what we believe is needed is embodied in S. 2091 and S. 2092.

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33. NGPF, Groundwater: Saving the Unseen Resource, in Groundwater Protection (The Conservation Foundation, 1987), pp. 13-14.

34. The National Wildlife Federation Corporate Conservation Council, "Statement of Policy and Practices for the Protection of "Ground Water" (1986).

VI. The Elements of Comprehensive Federal Groundwater Pollution Legislation.

Congress should expeditiously adopt comprehensive groundwater legislation that will protect human health and the environment from significant sources of groundwater pollution. The legislation should emphasize, as does S.2091, that because groundwater clean up is extremely expensive and sometimes impossible, prevention of contamination must be achieved where possible.

A. Goals of Groundwater Legislation.

Federal groundwater legislation should have as its goal the protection of the nation's groundwater resource from pollution, rather than being restricted to protecting current uses or now-projected uses of groundwater. But the law also should not be blind to groundwater's important uses. It should also set as a goal the protection of current and future generations of Americans from drinking and using polluted groundwater, whether publicly supplied or from a private well. We are not sufficiently prescient to foresee all of the needs of future Americans, nor are we omniscient in our understanding of the interconnections between aquifers and surface waters. In addition, the law should seek to protect the groundwater resource from degradation that may harm sensitive aquatic organisms and ecosystems. It should establish a clear national policy that our generation should bear the social and environmental costs of our economic activities, rather than leaving a polluted groundwater resource as our legacy.

These over-arching goals should be encouraged through two important sub-goals. First, we must maintain the biological, physical, and chemical integrity of the nation's groundwater resource. Second, as a long-term goal, there should be no toxic discharge to groundwater. Section 101 of the Clean Water Act calls for the same two goals for surface waters.

These goals, as is clear from S. 2091 which generally embodies them, need not imply that achievement of the goals are immediately achievable. They should, however, guide both federal and state policy decisions.

B. The Elements of Comprehensive Groundwater Legislation.

These goals should be achieved through a detailed federal law that weds the source-by-source "technological standards"[35] with the utility of numerical limits on contamination of groundwater by particular contaminants. Those responsible for each source of groundwater contamination should be required to do all that is feasible to eliminate or mitigate planned or unplanned releases to groundwater. For major point sources of groundwater contamination, such as industrial pits, ponds, and lagoons, public or private landfills, mines, and sewage treatment lagoons, we believe that federal permits, issued by states with approved programs, should directly impose source control requirements. For more diverse and numerous sources, such as septic tanks and fertilizer application, source control requirements should be imposed by states through an EPA-approved state strategy that would include regulatory requirements, public education efforts, permits by rule, economic incentives, or other regulatory and non-regulatory means designed to maximize groundwater protection.

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[35] The term "technological standards" is used loosely here and would include general standards of care and best management practices that can be utilized to mitigate or alleviate groundwater pollution.

Water quality standards, based on human health and environmental considerations, would be used as a "backup" to the source control program; under no circumstances should standards be used to imply an "acceptable" level of pollution. Standards, as employed in this approach, are most important in evaluating the utility of and compliance with technological standards; they are key to triggering of enforcement actions. Many state officials have pointed out that generally states are ill-equipped to conduct the research and technical analyses needed to develop numerical groundwater standards, arguing that this is more appropriately a federal function. The GAO recently has completed a report that confirms this view, but notes that many states have, in the absence of federal action, set their own standards based on available information.[36]

While a partnership of local, state and federal levels is fully appropriate and desirable for any groundwater protection scheme, the federal government's role must not be restricted to standard setting, research, guidance, technical assistance, and payment of the clean up bill. The principle of uniform national standards setting a "floor" for protection has been critical under other environmental statutes and should be incorporated into a national groundwater bill.

The federal government, through the EPA, must also take an active role in approval and oversight of state programs, and the federal government must be obligated to implement or enforce federal groundwater protection programs in the event that states fail or choose not to do so.

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[36] GAO, Groundwater Quality: State Activities to Guard Against Contaminants, (GAO/PEMD-88-5 (February, 1988).

Groundwater classification would be utilized to provide for an additional level of protection for particularly vulnerable or particularly crucial groundwater resources. Imposition of additional controls, over and above those required by technological standards, would be appropriate in designated sensitive or special areas. In no case should classification be used to lessen the stringency of established technological standards. Congress should explicitly reject the idea of "signing off" aquifers, to become our generation's garbage cans. We cannot know today the needs of generations hence; desalinization already is being explored in some areas that once enjoyed what seemed to be abundant fresh water resources.

Federal groundwater legislation should provide for public access to information and active involvement in the development of state and federal program regulations, permit approvals, and enforcement and oversight activities. A federal right of action should be included in the statute.

The legislation should get the federal house in order. It should require a detailed plan for protecting the groundwater that is critical to maintaining the continued vitality of the one third of the nation's land that is in the federal domain. The legislation also should direct that the government's many groundwater protection activities be better coordinated through an inter-agency committee, but should not give the Office of Management and Budget more authority in doing so.[37]

While S. 2091 embodies most of the provisions suggested above, it fails to require such a plan for federal lands. As a whole, however, that bill comes close to providing the basic and workable approach that is needed to establish an effective federal groundwater pollution control strategy.

VII. SPECIFIC ISSUES RAISED BY LEGISLATION BEFORE THIS COMMITTEE.

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[37] Congress should be careful in requiring such coordination not to delegate substantial new authority to the Office of Management and Budget (OMB). As this Committee's and many other reports repeatedly have demonstrated, OMB's reviews of regulations and studies under Executive Orders 12291 and 12498, are often hostile to environmental protection programs. *See, e.g.*, Senate Environment and Public Works Comm., Committee Print No. 156, 99th Cong., 2d Sess., *Office of Management and Budget Influence on Agency Regulations* (1986); House Energy and Commerce Comm., Subcomm. on Oversight and Investigations, *Investigation of the Environmental Protection Agency: Report on the President's Claim of Executive Privilege Over EPA Documents, Abuses in the Superfund Program, and Other Matters*, at 278-95 (1984)(listing "serious abuses" by OMB during its reviews of EPA regulations); Olson, *The Quiet Shift of Power: Office of Management and Budget Supervision of EPA Rulemaking Under Executive Order 12291*, 4 Va. J. Nat. Res. L. 1 (1984).

In a recent particularly shocking attempt to sweep the groundwater pollution situation under the rug, OMB wrote a paper arguing that the Executive Branch should argue that groundwater pollution simply is not a problem. We have attached a copy of the draft of this report and of EPA's response to it to this testimony. (Exhibit A).

Below we briefly discuss several specific issues that are raised by the groundwater related legislation that is now before this Committee.

A. S. 20--The First Attempt for Comprehensive Groundwater Protection Bill Introduced in Congress.

The first piece of comprehensive groundwater protection legislation introduced was S. 20, sponsored by members of this Committee who recognize the importance of groundwater protection. This bill was intended to get the national debate on groundwater legislation off the dime, and it has served that function well. We commend the sponsors of the bill for getting Congress to focus on this important national issue. We also strongly agree that each of the elements identified in section 7 of S. 20 are important components of an effective state groundwater protection program.

However, we do not believe that S. 20 can achieve its goal of protecting the nation's groundwater. To do so, the elements for an acceptable state program must be made far more specific. EPA must be authorized to approve or disapprove the state program. Otherwise, there is no way to assure that states disinclined to adopt effective groundwater protection programs will do so.

The backbone of S. 20 is a requirement that EPA establish groundwater quality criteria, from which states will develop their own groundwater standards. According to S. 20, state standards generally are to be based on primary drinking water regulations, which are established not just on human health protection, but on the costs of treating water already polluted. For many contaminants, there are no such drinking water regulations, meaning that under the bill there would be no control on how weak the state standards could be for those contaminants. Moreover, drinking water standards ignore the potential effects of polluted groundwater on surface aquatic ecosystems, which often are interconnected to groundwater.

In the context of preventing future groundwater contamination, the groundwater protection standards should be aimed at assuring human health and ecological protection; the economics of after-the-fact clean up of polluted water should be irrelevant. In addition, S. 20 includes no provision for EPA to disapprove of inadequate state standards. Thus, we fear that under this bill, no matter how good EPA's intentions and criteria are, states would remain free to adopt lax standards unprotective of public health and the environment, thus defeating the purpose of federal legislation.

Perhaps more fundamentally troubling is the bill's heavy reliance on groundwater quality standards, in conjunction with its failure to assure that direct controls will be placed on sources of groundwater pollution. There are three important problems with an exclusively standards-based law. First, in the groundwater context, once it is found that standards are exceeded, it is too late: the damage is done, and clean up is difficult, expensive, and time-consuming. Prevention is cheaper, and not necessarily achieved by an "after-the-fact" standards-based scheme.

Second, a standards-based law must rely very heavily upon monitoring of groundwater around the pollution sources. Such monitoring often is difficult, and may fail to detect problems because of poor design. Ambient groundwater monitoring probably is not a realistic option for many sources, such as the nation's 22 million septic tanks. In any event, while monitoring is an important "backup" to assure that source controls are working, it should not be a substitute for actual reductions in discharges to groundwater.

Third, experience with EPA's standards setting program under the Safe Drinking Water Act demonstrates that standard setting is a time-consuming process. Realistically, it will take many years for EPA to issue the criteria, and even then they will cover only a fraction of the contaminants known to pollute groundwater. If we must wait for the EPA criteria to be developed, and then for states to adopt standards based on those criteria before direct controls must be placed on sources of pollution, we will have a very long wait indeed, during which groundwater pollution may continue unabated.

Finally, we are deeply troubled by S. 20's "Special Groundwater Systems" provisions, which allow states to set lax and unprotective standards, with no federal oversight or veto authority, and with no standards for judging the adequacy of the "Special Groundwater System" standards. Apparently, states may even "sign off" large aquifers. Section 5(f) of the bill would make a standard adopted for a Special Groundwater System "the standard" for any Superfund or RCRA clean up, again with no federal recourse. Although we are certain that this provision was not intended to decrease groundwater protections offered under current law, the "Special Groundwater System" provision as drafted is a formula for disaster. It would substantially weaken Superfund and RCRA by allowing a state unilaterally to dictate--without clear standards for adequacy and without federal disapproval authority--how clean is clean, or, more to the point, how dirty is acceptable. We are sure that this weakening of current law is not what was intended by the bill's sponsors.

Therefore, while we have no doubt that the sponsors of this legislation intend to require effective state groundwater protection schemes, and have no intention of weakening existing law, we believe that the Committee should no longer rely on S. 20 as the vehicle for debate.

B. S. 2091 and S. 2092: Worthy Vehicles for Congress' Debate of Comprehensive Groundwater Protection Legislation.

On February 25, 1988, Senators Durenberger, Baucus, Stafford, and Chafee introduced the first detailed blueprint for a comprehensive national strategy to effectively prevent groundwater pollution. The legislation they introduced, S. 2091 and S. 2092, would establish as a national policy that the nation should protect the integrity of its precious groundwater resources.

This legislation holds that we should not speak for tomorrow's generations by relegating some aquifers to a fate of purposeful pollution, and that this generation should bear the costs of its economic activities. The legislation would establish a comprehensive national groundwater protection program based on direct controls placed on all major sources of groundwater pollution, using groundwater standards as a backup for those direct source controls, and requiring state programs that would implement these protections. The legislation includes many ambitious features for groundwater monitoring and assessment, for advancing research and development on groundwater problems and the solutions to them, for replacing contaminated private wells, for technical assistance to states and localities, and for better coordination of groundwater protection programs. The legislation is a major achievement; it will allow the nation to get down to serious, focused, and specific debate over what we as a nation can do to address this critical issue for the 1980s and beyond.

We are not wedded to every portion of these bills, nor do we believe that they adequately cover all of the methods available to assure groundwater protection. However, that they are a major step in the right direction. While we are still carefully reviewing this detailed legislation, we believe careful attention must be paid to the drafting of a few of the sections of S. 2091, such as the corrective action provisions of section 403, the variance and waiver provisions in sections 301(b) and 306(j), and the exemptions from permitting requirements in section 306(k). In addition, the bill has a few gaps. For example, greater attention should be paid to waste and source reduction in the legislation, and the final bill should call for significantly more efforts in the integrated pest management and sustainable agriculture areas.

Overall, however, the legislation is a very important positive contribution. It includes many creative ideas, such as the Ground Water Management Districts called for in section 703, and the Technical Assistance program that would be established under section 701. The "pay-as-you-go" tax provisions of S. 2092, and the Groundwater Protection Reserve program outlined in Section 308, also deserve serious consideration. We urge this Committee to use this legislation to focus the debate on groundwater legislation.

C. S. 1419: Controlling Pesticides in Groundwater.

While ideally pesticides should be one of many groundwater pollution sources dealt with through comprehensive legislation, it is important that we address this problem as soon as possible. Federal legislation similar to that embodied in S. 1419 introduced by Senators David Durenberger and Patrick Leahy would swiftly put into place critical protections to control groundwater contamination by pesticides. S. 1419 appropriately embodies the following key elements of an effective federal pesticides in groundwater law.

As a first step, health-based groundwater quality criteria are used. Where maximum contaminant level goals (MCLGs) have been established under the Safe Drinking Water Act (SDWA), these should be used as groundwater standards. This approach would establish a much more protective criteria than the technology based standards (MCLs), which EPA sets under the SDWA after consideration of the costs and feasibility of treating polluted water. When we talk about technology-based standards we must keep in mind that in rural areas where the contamination of agricultural chemicals can be most severe, there is little opportunity to supply technical fixes. Prevention is the key. Setting health-based standards is an essential prelude for developing effective pollution control strategies. Ultimately, environmental considerations, as well as human health protection, should be included in the setting of these standards.

Second, the definition of underground sources of drinking water must include potential groundwater supplies, not just current sources of drinking water. It is important that we protect the future sources of drinking water supplies for our children and grandchildren's sake. Groundwater not currently used for drinking water may be a critical source a decade or more from now.

Third, strict provisions to collect data on, to monitor, and to restrict the use of pesticides which can leach into groundwaters are mandated. The burden of monitoring must be placed upon the registrant. EPA must be able to require detailed and thorough monitoring, and best management practices must be developed by the registrant.

Fourth, provisions of the bill prompt rapid action by states on site-specific pesticide contamination before health-based standards are violated - usually within 90 days. An adequate groundwater bill must establish health-based groundwater residue guidance levels (GRGLs: "gurgles"); and the bill must have sensitive triggers to promote rapid remedial action when groundwater is contaminated to 50% of the GRGL.

In other words, if the health standard for a pesticide was established at 10 parts per billion, area-wide monitoring could be required by EPA if the pesticide was found at levels of 5 parts per billion in a drinking water well.

If the contamination were found at levels greater than 50% of the GRGL, then the state would have to take action to prevent further contamination. If the state fails to take action, the EPA could step in and prohibit the use of the pesticide in the vicinity.

Fifth, state programs will have to be established to prevent groundwater and surface water contamination. Public participation must be provided, and EPA must have oversight responsibilities. Many states have had almost no monitoring or planning underway. As is recognized by S. 1419, the goal should be a minimum federal standard or floor from which states could develop more protective programs. As is the case with pesticide residues and food quality, federal legislation should not preempt states' authority to set more stringent public health standards.

Sixth, EPA should be forced to establish a GRGL whenever a pesticide used according to routine agricultural practices has been detected in three wells. Where the EPA has not established a GRGL, the default value of 5 micrograms per liter should be established. This provision would not allow continued pesticide pollution while EPA takes its time setting a standard. Currently, once a chemical has been selected for standard setting, EPA might require 3-5 years to establish a drinking water standard. For the vast majority of active and inert ingredients, it is unlikely that enforceable drinking water standards will be established within the next decade.

These provisions form the core of the Groundwater Safety Act of 1987 (S. 1419), a bill introduced this past spring by Senators Durenberger and Leahy; NWF strongly supports this bill.

D. S. 1105: A Comprehensive Groundwater Research Bill.

Several Senators on the Committee have sponsored S. 1105, a comprehensive groundwater research bill. We support this bill as an important step towards adopting a national groundwater research and data dissemination policy. However, we urge the Committee to recognize that while research and information dissemination are important, we need comprehensive groundwater protection legislation now to protect groundwater from further pollution. Research should not be allowed to become an excuse for inaction on preventing groundwater pollution today.

S. 1105 divides the federal government's groundwater research efforts among the federal agencies. USGS appropriately should be the lead agency to conduct research and data review on national trends in groundwater contamination, and to do broad-picture, area or aquifer-wide mapping, and broad-brush or basic research on geology and hydrology. EPA, on the other hand, is better equipped to conduct groundwater pollution source investigations, to require source controls, to investigate health impacts of exposure to contamination, to identify environmental effects of groundwater pollution, and to conduct research and investigations that have regulatory or enforcement implications.

The two agencies would benefit significantly from a closer working relationship, and from better coordination of their efforts. There is significant potential overlap in the two agencies' programs, for example in the area of technical assistance and localized contamination investigation. Close inter-agency coordination can avoid duplication of efforts, and assure that USGS research is, to the extent possible, helpful to EPA, states, local governments, and citizens in regulating or cleaning up groundwater pollution. We believe that S. 1105 would help move toward that goal.

We have two suggestions for improving S. 1105. First, while sections 301 and 401 in a limited way call for research into how to better use fertilizers and agricultural chemicals, we believe that the bill should include a stronger and more specific requirement for a major research, demonstration, and technology transfer program to encourage integrated pest management and low input or sustained agriculture. The program should include a careful analysis of how well current controls on agricultural chemical use, in particular the use of pesticide labels, is actually working in the field. The study also should review whether agricultural chemical labels, dealers, or extension service agents are encouraging excessive use of these products. In addition, the program should require EPA's pesticides in groundwater monitoring program to be broadened, and to include a survey of groundwater contamination near pesticide dealers and loading and mixing areas, a problem now documented in Iowa.[38] The program should be paid for with tax on agricultural chemicals and household fertilizers and pesticides.

Second, the bill should mandate a two-year study by EPA and the Agency for Toxic Substances Disease Registry of the estimated national extent of exposure of the American public to toxic chemicals and pathogens due to groundwater pollution. The study should include the agencies' best estimates and worst case estimates of the possible current and future impacts of groundwater pollution, and a discussion of data gaps that need to be filled to improve our knowledge of this problem. The study should review any epidemiological studies conducted at groundwater contamination sites, but should not limit itself to those studies. The study also should evaluate the potential and estimated ecological impacts of groundwater contamination caused by groundwater-surface water interaction, and by possible pollution of subterranean ecosystems.

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[38] See, e.g., Hallberg, Agricultural Chemicals and Groundwater Quality in Iowa: Status Report 1985, (Iowa State Univ., 1985).

In summary, S. 1005 is an important piece of research legislation that deserves to be enacted. It would be improved by the addition of the amendments suggested above. But this research legislation should not be used to divert attention or momentum from comprehensive groundwater protection legislation.

VIII. Conclusion

There is no justification for waiting for more studies before we begin to require protective measures to prevent groundwater contamination in the first instance. Without such preventive action, a legacy of scarce, polluted groundwater that may forever be impossible to clean up or use, will be our bequest to our heirs. The sponsors of S. 2091 and S. 2092 have given us a chance to begin the quest for preventative action today. Let us not miss this opportunity!

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1412 Sixteenth Street, N.W., Washington, D.C. 20036-2266 (202) 797-6800

RESPONSES TO COMMITTEE'S GROUNDWATER QUESTIONNAIRE.

1. **Is there a need for federal groundwater legislation or are other federal statutes adequately addressing this need (esp. SARA, RCRA, SDWA, CWA)?**

As is discussed in the testimony, there is a strong need for federal legislation to protect groundwater. The statutes named in the question have important gaps, and need to be implemented in a more vigorous and coordinated way. (see testimony).

a. **Would a federal statute weaken other existing federal programs for groundwater?**

A new federal statute need not, and indeed should not, weaken existing federal programs for groundwater. However, careful drafting is important. The "Special Ground Water Systems" provisions in section 5 of S. 20, for example, would inadvertently weaken Superfund, SARA, and RCRA. (see testimony).

b. **What efforts could be made to integrate and strengthen all these statutes?**

These existing statutes should be better integrated through an inter-agency committee to assure that duplication of effort is minimized, and to assure that, to the extent possible, USGS and USDA research is targeted and useful for EPA's groundwater pollution control efforts. However, this inter-agency coordination should be limited to advice; EPA should not be required to have other agencies approve its rules or actions. In addition, there is a need for EPA to better coordinate its implementation of these laws with not only the Office of Water, the Office of Solid Waste and Emergency Response, and several other headquarters offices, but also with the regional offices, which often implement policy in a conflicting fashion.

2. **Should the primary responsibility for groundwater management reside with State and local governments, or should there be a national goal set by the federal government? If there is to be a national goal, which agency should set it and what should it be?**

--Should there be a strict federal nondegradation policy, a limited one, or should the states decide on nondegradation?

There should be national requirements for groundwater protection, set at the national level. States should be given the responsibility to assure that all citizens are protected at least as well as required by the federal law. EPA is the agency best able to implement a groundwater regulatory statute, although the USGS and USDA also should play important roles in research technical assistance in their areas of expertise.

The goals of federal legislation should be to protect the nation's groundwater resources from pollution, to assure that all Americans today and in the future will have safe drinking water, and to protect sensitive aquatic ecosystems from the effects of groundwater pollution. The chemical, physical, and biological integrity of the Nation's groundwater must be protected from contamination, and ultimately, the goal of the law should be to eliminate toxic pollutant discharge into groundwater. This goal is similar to the goal of the Clean Water Act. It need not be stated in a way that suggests that it is immediately achievable, but it should serve as a goal to guide decisions made on groundwater pollution source controls and other issues that arise under the Act. We believe that S. 2091 eloquently and appropriately states these goals.

3. **Do you support federal groundwater permits based on water quality criteria or federal source controls based on potential for groundwater contamination?**
--If so, for what sources?

Yes, as detailed in our testimony, we do support such federal permits, for major sources of contamination. We believe that most industrial facilities that have potential point sources of groundwater contamination such as landfills, impoundments, pits, ponds, lagoons, and materials storage and transfer operations, should have a permit. In addition, many other point sources of groundwater pollution should be required to have permits, such as mines and ore or mining waste storage or disposal, municipal landfills, above ground storage tanks, large agricultural waste pits, ponds, lagoons, and impoundments, oil and gas exploration and production wells and waste pits, and public or industrial sewage treatment ponds and lagoons. Many or all of these facilities must already have Clean Air Act or Clean Water Act permits, and the new groundwater permit should not be foreign to them. In addition, some states already have a permit requirement for the groundwater discharges from many of these sources.

Groundwater permits, in conjunction with air and surface water permits, will provide for more effective, multi-media control of chemical contamination.

4. How should the activities of Federal agencies be coordinated -- by a committee designated by statute, a statutorily designated lead agency, or should this be the responsibility of the president?

We generally favor the approach of designating the lead agency or agencies for each function in the statute. This minimizes post-enactment inter-agency squabbling and speeds up implementation. In addition, an inter-agency coordinating committee on groundwater, with activities delineated and supported by detailed MOUs, would be useful. For the reasons stated in the testimony, we believe that OMB should not be granted a substantive role in the programs. (see testimony). OMB has been hostile to many environmental programs, including groundwater and drinking water protection. (see Exhibit A).

a. In answering please consider whether there should be one lead agency for research and another for regulation

We believe that the division of research and regulatory authority proposed by S. 2091 generally is appropriate.

b. If there were to be a federal entity to coordinate research among the agencies is there an existing suitable entity? (e.g., FCCSET - The Federal Coordinating Council on Science Engineering and Technology).

We know of no existing federal entity that is effectively coordinating groundwater research. We urge Congress not to vest FCCSET, OMB, or any White House entity with statutory authority to prescribe what studies will be done, or even to "suggest" what studies will or will not be done. Such White House "suggestions" often are seen in the bureaucracy as the law, and in this arena, it would be politics, not legitimate scientific need, that often would guide research priorities.

5. For each of the following functional activities describe the role you see each of the various Federal agencies playing (including the funding and institutional arrangements, where appropriate), regardless of whether you approve of the function itself being carried out by the Federal Government.

a. approving of State plans for assessment, monitoring, protection, or management.

EPA is the most experienced and appropriate agency to carry out this function. However, the Agency needs substantial additional resources to carry out this or any other new function.

b. providing technical assistance on matters of hydrogeology, resource assessment, resource management, mapping of aquifers or recharge areas, or data management.

USGS, in cooperation with EPA.

c. providing technical assistance on matters of health effects, criteria setting, mitigation strategies, or remediation strategies.

EPA, in cooperation with ATSDR.

d. operating an information clearinghouse providing indexing of data, of literature (technical and lay), and of sources of expert advice and services to State and local government.

EPA, in cooperation with USGS, perhaps through a contractor.

e. conducting research on: hydrology, hydrogeology, fate and transport of chemicals in the subsurface, monitoring network design, analysis of the vulnerability of groundwater to contamination.

USGS and EPA, cooperatively. State matching grants also should be made available.

f. conducting research and development on techniques for preventing contamination from: agriculture, domestic waste disposal, industry (including extractive industries), and other sources.

EPA, with the cooperation of USDA on agricultural issues, and with the assistance of the Bureau of Mines on extractive industry contamination.

g. conducting research on health and ecological effects of contaminants.

EPA.

h. conducting research and development on methods of remediation and treatment on contaminated groundwater.

EPA.

i. issuing health advisories.

EPA, with cooperation from ATSDR.

j. conducting resource assessments.

USGS, in cooperation with EPA.

6. How should the needed university research and educational programs related to groundwater be strengthened (e.g., institutes, fellowships, competitive research grant programs) and how should these be administered?

We believe that the provisions in Parts F and G of S. 2091 would be helpful in this regard.

a. The Water Resources Research act (P.L. 98-242) is authorized through 1989. This Act funds 54 research institutions on a

40/60 federal/state matching basis. How can this program be incorporated into the new groundwater bills?

We agree that section 203 of S. 1105 is appropriate.

7. **Comment on the USGS National Water Quality Assessment Program and how that relates to any of the assessments and studies in S. 20, S. 1105 and H.R. 791.**

The S. 20 groundwater assessment provision assigns responsibility to the states, whereas S. 1105 and H.R. 791 (H.R. 3636 as adopted by the full House) rely on the federal government. We believe that the more detailed reports required by the latter two bills would be most useful. The reports envisioned by the House bill and by S. 1105 would be broader in scope than USGS's current "National Water Summary" series, and would require more coordination between USGS's assessment efforts and EPA's regulatory and research efforts.

a. **Are the time frames for these assessments and studies reasonable?**

The time frames are optimistic. If less than one year is given to complete a report, it likely will be based on existing data. This type of report, if required to be updated, however, would still be useful. In addition, establishment of an ongoing statutorily authorized assessment program is a good idea.

8. **Comment on EPA's classification scheme and how it relates to each of the three bills.**

We believe that the legislation should repudiate EPA's groundwater classification scheme, as proposed in S. 2091.

9. **To what extent should the federal government concern itself with groundwater depletion? -- research only? regulation?**

At this point, the federal government's groundwater effort should focus upon groundwater quality problems. However, protection of the quality and availability of groundwater on federal public lands properly is a federal issue, and federal land managers should manage and protect groundwater underlying federal lands. Good federal groundwater management would serve as a helpful model to states, localities, and private entities. In addition, we believe that the premise of H.R. 2320 is entirely appropriate; that bill would provide that if a state seeks a federal water project bail out necessitated by past mismanagement of the groundwater, the federal government will require that state have a plan for groundwater management.

10. **To what degree are states using land use controls to prevent groundwater contamination?**

    Some states, such as New York (Long Island) and Massachusetts (Cape Cod) have successfully used this strategy.

11. **Given limited fiscal resources, what are the priority programs and activities to fund in these bills.**

    We believe that a self-supporting "pay-as-you-go" bill, like that envisioned in S. 2091 and S. 2092, would establish a workable way to pay for all aspects of federal groundwater protection legislation. Before such legislation is passed, it is important the Congress fund existing programs, such as the Safe Drinking Water Act's groundwater related provisions, and fund ongoing groundwater research. We urge the Committee to refrain, however, from thinking in terms of severing off parts of groundwater protection programs for funding, which will result in the continuation of the current disjointed and balkinized federal groundwater protection scheme.

12. **Please point our any exemplary state groundwater programs or add any other comments not covered in your statement.**

    Wisconsin and Iowa both have adopted progressive elements of a state groundwater protection program.

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May 4, 1988

Ms. Nan Stockholm
Associate Majority Counsel
Senate Environment and Public Works Committee
Room 508 Hart Senate Office Building
Washington, D.C. 20510

Dear Nan:

Thank you for your cooperation in arranging our testimony at the March 24, 1988 Environment and Public Works Committee hearings on groundwater legislation. We thought that the hearing was very successful. I look forward to discussing the Committee's plans on groundwater legislation with you soon.

Also, I have enclosed a copy of a USGS memo discussing the incident referred to in my written testimony in which a USGS geologist was fired. An Interior Department employee approached me after the hearing, and said he thought the Washington Post article and my testimony's summary of that article failed to tell the whole story. I asked him to provide me with Interior's account of what happened, and he supplied the enclosed memo. I ask that the memo be added to the published record of the hearing.

Thanks for your help. I will be in touch with you soon.

Sincerely,

Erik D. Olson
Counsel
Environmental Quality
Division

United States Department of the Interior
GEOLOGICAL SURVEY
RESTON, VA. 22092

OFFICE OF THE DIRECTOR

In Reply Refer To:
WGS-Mail Stop 101

February 12, 1988

Memorandum

To: Principal Deputy Assistant Secretary--Water and Science

From: Director, Geological Survey

Subject: Termination of Contract Employee in West Virginia

In response to your inquiry of February 11, 1988 (attached), the article you cite in the Washington Post for February 9 is substantially true if somewhat biased in tone.

In October 1987, the U.S. Geological Survey (USGS) District Office in West Virginia issued a contract with Mr. Robert Beckett to assist in the collection of samples associated with a study of ground water in Jefferson County, West Virginia. The study was developed cooperatively between the Jefferson County Commission and the USGS Subdistrict Office in Morgantown. Investigations began in October 1987 with expected completion in September 1989. Because the Morgantown office was not fully staffed when the project began, it was necessary to perform some project functions under contract to Mr. Beckett.

The study was designed to describe the ground-water flow system and water quality of the principal aquifers in the County. As part of that data-collection activity, dye was injected in sinkholes to determine flow paths and rates in the ground-water system. One of the sinkholes was located near the site of a planned wood-treatment plant. Periodic samples were collected at stream, spring, and well sites for subsequent analysis for the presence and concentration of dye. Mr. Beckett was involved in this sample-collection activity. Preliminary laboratory results suggested that dye from the sinkhole near the plant site reached the Charles Town Race Track and possibly the Charles Town Water Works. These data have not been verified by the lab or evaluated by the project hydrologists.

It is the policy of the USGS not to make public results of any investigation until they have been internally verified, prepared for publication, undergone colleague review, and approved for publication by my office and the cooperating agency. None of the data from the West Virginia study had ever completed the first step of this approval process.

When Mr. Beckett was issued the contract to work on the project, he was informed of this policy and cautioned not to become involved in any politically sensitive ground-water issues while under contract to the USGS. Although Mr. Beckett had agreed to these stipulations, he violated them when he released unverified USGS data and his interpretations of that data to the press on January 21, 1988, without agency authorization.

On January 22, 1988, the Jefferson County Commission contacted the USGS to inform us of Mr. Beckett's actions and to express concern that the impartiality of our investigations had been violated. Mr. Beckett was contacted promptly to verify his breach of contract. Mr. Beckett continued to discuss the USGS project with the press. Accordingly, the contract was terminated by the West Virginia District Chief, effective January 31, 1988. Although Mr. Beckett indicated in a letter dated February 3, 1988 (transcribed copy attached), that he understood the USGS position, he subsequently told the press that he had been unjustly fired.

Mr. Beckett's contract was terminated a few weeks earlier than was planned. However, the contract would have been terminated anyway. The staff position in the Morgantown office has been filled, and Mr. Beckett's services were no longer required.

I fully support the actions of the West Virginia District Chief in this matter. It is imperative to the scientific integrity of our mission and to the impartiality of our data dissemination that the established policies on information release be followed strictly. The reaction of our cooperator to this incident is witness to this necessity.

Attached please find a copy of the issue paper on this subject that previously was supplied to the Department and to the District Chief to assist in their responses to public inquiries. If you require any further information or documentation, please do not hesitate to contact me.

Dallas L. Peck

Attachments

cc: General Files (MS 114)
Director's Chron (MS 114
Chron File (MS 121)

WGS:DO:RLHoughton:2/12/88

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Suite 300
1920 N Street N.W.
Washington, D.C. 20036
202/861-2800
TWX 710/822-0126
Easylink: 62756020
John A. Knebel
President

Statement of

BRUCE R. LEAVITT

Hydrogeologist
Consolidation Coal Company

on behalf of the

AMERICAN MINING CONGRESS

before the

Subcommittee on Water Resources,
Transportation and Infrastructure

and the

Subcommittee on Hazardous Wastes
and Toxic Substances

of the

Committee on Environment and Public Works

United States Senate

Hearing on
National Ground-Water Legislation

March 24,1988

My name is Bruce R. Leavitt. I am a hydrogeologist with the Environmental Quality Control Department of Consolidation Coal Company and Chairman of the American Mining Congress (AMC) Ground-Water Task Force. AMC is a national association of companies that produce most of the Nation's supply of metals, coal and industrial and agricultural minerals. AMC is pleased to have this opportunity to express its views on the vital subject of ground-water protection.

Included with this testimony as attachments are AMC's comments on Senate Ground-Water Bills; "Responses of the American Mining Congress to the Senate Environment and Public Works Committee Ground-Water Questionnaire"; three white papers on ground water entitled "Mining and Ground Water," "Ground-Water Management: Federal & State Roles"; and "Ground-Water Management: Nondegradation Versus Management for Multiple Use;" and a legal memorandum dated August 14, 1987, regarding "Federal vs. State Regulation of Ground Water Quality." I request that my statement, including these attachments, be printed in the record in its entirety.*

The American Mining Congress believes that judicious ground-water protection is vital to the health of our citizens and our economy. Mining and ground water are inextricably intertwined. In order to remove minerals from the earth, it is necessary to excavate them from within, above, or below aquifers. This unique view of the ground-water resource, and I might add that we are among the few who actually see ground water, has led AMC to develop a realistic approach to ground-water management. The mining industry believes that the most prudent course of action is to manage this vital resource for the maximum benefit of society. Proper management requires both the knowledge of the resource and the needs of society, now and in the future.

The very act of mining changes the ground-water system around the mine. The most obvious effect is that ground water flows into the mine. This causes changes in the level of ground water in the aquifer. Mining also breaks up the rocks that contain the minerals. Fresh rock surfaces are exposed to the weathering process. Ground water passing over this broken rock can dissolve certain components of the rock as well as any weathering products. This causes changes in the natural water chemistry. Because mining occurs in areas where ore minerals are abundant, it is not unusual to find elevated concentrations of some minerals in the naturally occurring ground water and mine water.

These consequences of mining are unavoidable. We cannot prevent ground water from entering the mine, nor can we prevent the dissolution of soluble components of the rock. This may limit the use of the ground water in and around a mine. Clearly we must minimize our impacts to ground water, but just as clearly this Nation cannot exist, as we know it, without mining.

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*The white papers referred to have been retained in committe files.

Mining is not the only activity of our society that has an unavoidable impact on ground water. Septic tanks represent the single largest contribution of contaminants to ground water. The use of fertilizer has caused ground-water contamination in a number of states while providing food supplies and other important agricultural commodities. Highway deicing compounds find their way into the ground water after they have reduced hazardous conditions on our Nation's highways. Other beneficial activities such as construction and forestry also have been documented as contributing to ground-water contamination.

The similarity in all of these activities, including mining, is that they provide significant benefits to society and they cannot be conducted without some impact to ground water. If our purpose is to restrict ground water only for drinking, then we may effectively prohibit these other beneficial activities. Attached to this testimony is a paper entitled "Mining and Ground Water," which amplifies the relationship between society, mining and ground water.

Some people believe that ground water can be protected without knowledge of the hydrogeology. This belief is in error. To illustrate this point I have brought a ground-water vulnerability map of Madison County, Ohio, which was prepared by the State of Ohio. This map portrays the relative potential for a contaminant, introduced at the surface of the ground, to affect the quality of the ground water below. This map has been prepared from existing data using the DRASTIC methodology developed by the National Water Well Association under contract to EPA. Glacial geology is a major factor in Madison County, and consequently this map should be of special interest to members who represent states that have been glaciated such as New York and Minnesota.

You will notice that the map has been divided into seven different colored areas. Each color represents a different level of ground-water vulnerability. The orange areas are the most vulnerable to contamination, and the purple areas are the least vulnerable. Sole reliance on source controls would mean that a new sanitary land fill could be located anywhere in Madison County without regard to the hydrogeology. However, with the use of a ground-water vulnerability map, it becomes clear that some geologic settings are far better able than others to protect ground water and hence would be better for siting a sanitary land fill. In addition to aiding resource managers, these maps are also useful to industries that may be choosing a location for a new facility. Because of the liabilities that arise out of RCRA and SARA, it is advantageous for industry to locate at a site that minimizes its exposure. Ground-water vulnerability maps cannot substitute for detailed site investigations, but they can encourage development in areas of lower risk.

Unlike the siting of sanitary land fills, mining does not have the luxury of locating in the most advantageous site for ground-water protection. Mines must be located where the resource exists. Consequently, choices must be made about the use of competing resources. For example, glacial activity left behind outwash channels that contain sand and gravel. These channels can be seen on the vulnerability map in orange and yellow. Sand and gravel is utilized in large quantities in the construction of homes, buildings and roads, and it also forms some of the most productive aquifers. Three gravel pits exist in Madison County. The extraction of sand and gravel not only affects the quantity of ground water present but also can impact the ground-water quality and the aquifer's future vulnerability. In fact the mining of sand and gravel constitutes the removal of part of the aquifer. Society's need for aggregate is in conflict with society's desire to protect ground water. This conflict calls for an informed resource management decision, which considers the importance of the aggregate to society, the impacts of mining it on the ground water and society's need for that ground water.

These decisions cannot and should not be made in Washington. At the state level, the control of ground-water quantity and quality meet, and the ability and flexibility to manage the resource become focused. Consideration must be given to such factors as drinking water needs, water rights, hydrogeology, past and future land use, and economic development. This subject is treated further in an attachment to our testimony entitled "Ground-Water Management: Federal and State Roles." We recommend this paper for your consideration.

Some believe that the states are not acting to protect this resource. I mentioned previously that this map was prepared by the State of Ohio. Ohio is undertaking the preparation of ground-water vulnerability maps on a county-by-county basis for the entire state. Some of the work will be done internally and some of the mapping will be done by contract ground-water consultants in an effort to speed the process. Other states are undertaking similar programs. At this time AMC is aware of activity in Virginia, Florida, Arizona, Idaho, Washington, Nebraska, Kansas, and Georgia. While this list is not exhaustive, it indicates that the states are willing and able to undertake detailed analyses of their resources in an effort to protect ground water.

Ground-water vulnerability mapping is only one example of active state efforts to protect ground water. Other areas of state activity include the development of protection strategies, the enactment of legislation where necessary, and the establishment of ground-water quality standards.

Public education is a major factor in effective ground-water protection. Indiscriminate disposal by individuals of waste or unused products can cause contamination. Regulation cannot cope with ground-water contamination at this level. Therefore, AMC supports broad-based public education about ground water. These programs should be developed by the states and non-profit organizations.

Nondegradation has been proposed as a means of achieving ground water protection. This concept is unworkable because, as we have discussed, it is impossible to conduct many essential human activities without adding contaminants to ground water. Even the proponents of non-degradation admit that it is unachievable. Use of the term creates confusion and misunderstanding. Simply redefining nondegradation to mean something else does not protect ground water and one has to question if this approach is being honest with the American people. Rather than redefining terms, it is better to recognize the technical realities and manage the resource to accommodate competing beneficial uses. A thorough discussion of this subject, entitled "Ground-Water Management: Nondegradation Versus Management for Multiple Use" is attached to this testimony.

In conclusion, the American Mining Congress supports the management of the ground-water resource for all of society's needs, now and in the future. Simplistic concepts, such as non-degradation, and inflexible regulations obscure the real work that needs to be done. Because of the diversity of the resource and its utilization, the most appropriate role for the federal government is to provide technical and financial support to the states and allow maximum flexibility in how the states choose to protect their ground water.

# # #

American Mining Congress
Comments on Senate Ground-Water Bills

March 24,1988

The American Mining Congress has reviewed the three bills that are being considered at this hearing. While we share the concern of many regarding national and state budgetary constraints, in our opinion some federal stimulation and direction needs to be given to ground-water research. We believe that H.R.791 is an effective way to understand the complexity and the variability of our ground-water resource, as well as to develop techniques to minimize man's impact on it. We are encouraged by the support which H.R.791 provides for the states' role in ground-water management, and therefore, AMC supports the passage of this bill.

S.1105 has been described as a research bill. While it does support some research, it is a cumbersome, expensive prelude to comprehensive federal ground water legislation. It is duplicitive of existing authority, and would divert resources from real ground-water protection into a bureaucratic black hole. For these reasons AMC oppose S.1105.

S.20 is a comprehensive ground-water protection bill. Although the bill grants some limited flexibility to the states, AMC does not believe that there is sufficient flexiblity for the states to develop multi-use resource management programs. As currently written, the bill supports national ambient ground-water standards. Ambient standards are unworkable when applied to ground water due to the natural variability of the resource. Ground water's variability affects ambient standards in two ways. First, many areas of the country have ground water whose natural quality exceeds the primary drinking water standards. These areas will never be in compliance with such standards. Large parts of the Upper Midwest have ground waters that are naturally high in sulfate. If the primary drinking water standards are applied to ambient ground water, thousands of domestic water supplies will be out of compliance.

Second, ground water quality varies not only from region to region but also within very short distances. The use of wells to ascertain water quality cannot be interpreted to mean that the ground water is of the same quality a few hundred feet away. Any regulatory program based on an assumption of uniformity will be constantly forced to modify its interpretations and actions as additional data become available. This will lead to constant contradiction and eventual agency paralysis.

AMC does not believe that federal programmatic legislation is necessary at this time. Therefore AMC opposes S.20.

AMC

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1920 N Street N.W.
Washington, D.C. 20036
202/861-2800

TWX 710/822-0126
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* Immediate Past Chairman
† Honorary

March 22, 1988

The Honorable Daniel Patrick Moynihan
Chairman, Subcommittee on Water Resources,
Transportation and Infrastructure

and

The Honorable Max Baucus
Chairman, Subcommittee on Hazardous Wastes
and Toxic Substances
United States Senate
Washington, D.C. 20510

Dear Senators:

This letter contains the responses of the American Mining Congress (AMC) to the "Ground-Water Questionnaire" you sent to us by letter of February 25, 1988.

AMC is an industry association that encompasses (1) producers of most of America's metals, coal, and industrial and agriculture minerals; (2) manufacturers of mining and mineral processing machinery, equipment and supplies; and (3) financial institutions and engineering and consulting firms that serve the mining industry.

RESPONSE TO QUESTION 1:

Ample authority exists in federal statutes (including the Surface Mining Control and Reclamation Act, the Comprehensive Environmental Response, Compensation and Liability Act, the Superfund Amendments and Reauthorization Act, the Resource Conservation and Recovery Act, the Safe Drinking Water Act, the Clean Water Act, and the National Environmental Policy Act) to protect ground water. AMC opposes new comprehensive, federal ground-water protection legislation. What is needed now is not another federal protection statute but wise and efficient implementation of existing statutory authority.

A clear example is the Wellhead Protection Program passed under the Safe Drinking Water Act Amendments of 1986. The law provides for a zone of protection around every public drinking water supply well in the country. To date, this legislation languishes, at least with respect to providing federal grants to help states develop wellhead protection programs, because Congress appropriated no federal funds for state grants in the FY88 budget.

AMC's opposition to new federal legislation does not extend to legislation providing for needed research on ground-water resources and contamination. There is much technical and financial assistance concerning ground water that could and ought to be rendered to the states by such agencies as the U.S. Geological Survey (USGS) and the Environmental Protection Agency (EPA).

Whether a new federal statute could weaken other existing federal programs for ground water would depend on its nature. A research bill, such as H.R.791 poses little potential for undercutting, and in fact could enhance, existing federal and state ground-water protection programs. A new federal control bill would pose a great potential for confusion and contradiction with existing programs. Moreover, new legislative programs and Congressional mandates may simply require reallocation of already stretched agency resources and draw attention and resources away from programs currently protecting the environment. New federal authority could virtually halt for a period of time state efforts currently underway to protect ground water or delay protection while states struggle to reshape their individual programs to meet a uniform federal program.

Increased knowledge about the Nation's ground-water resources will help strengthen and integrate federal and state protection programs. The mapping of aquifers, assessments of ground-water quality and quantity, studies of the fate and transport of contaminants, and risk assessment analyses for significant ground-water contaminants are all tasks that would complement and strengthen existing ground-water protection programs.

RESPONSE TO QUESTION 2:

Individual states should have primary responsibility for ground-water management. The reasons for this have been articulated clearly in the testimony of many of the witnesses before your Subcommittees, as well as before the Energy and Natural Resources Subcommittee on Water and Power in hearings last year. We have discussed the rationale for states having the primary responsibility in three of our white papers: "Mining & Ground Water," "Ground-Water Management: Federal & State Roles," and "Ground-Water Management: Nondegradation Versus Management for Multiple Use" (copies enclosed).

AMC is firmly opposed to any form of nondegradation policy. While such a policy may be appealing theoretically, it is inherently unworkable in practice. Strictly enforced, the policy would result in the cessation of human activity. Loosely enforced or implemented, it becomes, in fact, a differential protection standard. AMC's position on nondegradation is explained fully in the enclosed white paper, "Ground-Water Management: Nondegradation Versus Management for Multiple Use."

RESPONSE TO QUESTION 3:

AMC opposes federal ground-water permits per se and also federal source controls based on potential for ground-water contamination. With respect to the latter, see AMC's enclosed white paper "Ground-Water Management: Federal & State Roles." As explained in the response to Question 1, AMC believes there is already in existence adequate federal statutory authority to protect ground water. No new federal control program is warranted. What is needed is federal financial and technical assistance to help states develop and implement their own programs.

RESPONSE TO QUESTION 4:

AMC supports the position taken in H.R.791, as passed by the U. S. House of Representatives, which vests in the Office of the President responsibility and authority for coordinating the activities of the federal government with respect to ground water. There are several different federal agencies with expertise, legislative authority and data on ground water, for example, the USGS, EPA and the U.S. Bureau of Reclamation. The Office of the President is the logical body to coordinate among these various agencies.

RESPONSE TO QUESTION 5:

You have asked for a description of the role that should be played by each of the various federal agencies with respect to a list of ground-water related activities.

a. None of the federal agencies should play a role in approving state ground-water protection or management plans. As has consistently been stated in these answers, AMC opposes such a role for the federal government.

b. The expertise, data banks, and historical practice of the USGS make it the logical federal agency to provide technical assistance on matters of hydrogeology, resource assessment, resource management, mapping of aquifers and recharge areas, and data management. AMC believes that the capability of USGS to respond to state and industrial needs for ground-water information should be enhanced.

c. The EPA has the expertise to provide technical assistance on matters of health effects, criteria setting, mitigation or remediation strategies.

d. USGS and EPA, because of their expertise and extensive data collections, could provide an information clearinghouse for state and local governments.

e. USGS is the logical agency to conduct research on hydrology, hydrogeology, fate and transport of chemicals in the subsurface, monitoring-network design, and analysis of the vulnerability of ground water to contamination.

f. Agencies with expertise in a particular industry or source would be best qualified to conduct research and development on techniques for preventing contamination from that industry -- for example, the U.S. Department of Agriculture for agricultural contamination, the Bureau of Mines for the mineral extraction industries, etc.

g. EPA and the National Institute of Health have the expertise to conduct research on health and ecological effects of contaminants.

h. There are a number of federal agencies who are capable of and have experience with conducting research and development on methods of remediation and treatment of contaminated ground water, including the Bureau of Reclamation, the Bureau of Mines, the EPA, the Forest Service, the USGS, and the Bureau of Land Management. It must be remembered, however, that much of the work is planned and executed by private contractors and researchers.

i. EPA and the Public Health Service are best qualified to issue Health Advisories on contaminants in ground water.

j. Conducting ground-water resource assessments should be primarily the responsibility of the U.S. Geological Survey. Resource assessments involving minerals and ground water should be the responsibility of a broader based group within the Department of the Interior (i.e. the Bureau of Land Management, the U.S. Bureau of Mines, and the USGS).

RESPONSE TO QUESTION 6:

How university research and educational programs on ground water should be administered and strengthened is not within the expertise of the American Mining Congress. We do not feel qualified to respond to this question.

RESPONSE TO QUESTION 7:

AMC is not in a position to comment on the USGS National Water Quality Assessment Program and how that relates to any of the assessments and studies in S.20, S.1105 and H.R.791. Answers to this question should be sought from states, the USGS itself, and other federal agencies that have used the USGS studies.

RESPONSE TO QUESTION 8:

AMC's views on EPA's classification scheme are detailed in the enclosed comments on the agency's draft "Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy," filed March 2, 1987.

Ground-water classification is an approch to ground-water protection, which institutionalizes the concept that ground water varies in quantity, quality, vulnerability and use. Because of this variability and limited government resources, there is a need for flexibility in the management of ground water. A single protection standard does not address these needs. H.R.791 provides some of the data that is necessary to make an informed decision on the allocation and utilization of the resource. While S.20 allows the states to make some classification decisions, it does not provide enough flexibility to the states to adapt the concept to the needs of each individual state. S.1105 while providing needed research that would support a classification approach is geared more toward a single standard approach. This puts S.1105 in conflict with the resource managment goal that AMC supports. Therefore, AMC considers S.1105 to be the least favorable option with regard to ground-water classification.

RESPONSE TO QUESTION 9:

The federal government should restrict its involvement with ground-water depletion issues to research and providing technical and financial support to the states. Historically, the allocation of water resources has been considered the exclusive province of the states. For well over 100 years there has been a "consistent thread of purposeful and continued deference to state water law by Congress." California v. United States, 438 U.S. 645 (1978). This deference to state control of water rights is evidenced in federal statutes. There have been at least 37 federal statutes in which Congress has expressly deferred to state water laws. United States v. New Mexico, 438 U.S. 696, 702 at n.5 (1978). This historic relationship between the federal government and the states could be threatened by a federally dominated program for the regulation of ground-water quality (see Ground-Water Management: Federal and States Roles). States are in the best position to evaluate their own needs and regulate the allocation of ground water within their jurisdictions.

RESPONSE TO QUESTION 10:

AMC has not made a study of the degree to which states employ land use controls to prevent ground-water contamination.

One example has come to our attention. Ground-water contamination to the Rathdrum Prairie Aquifer, which is a sole source aquifer in Northern Idaho, is controlled by zoning of five acre parcels for septic systems. This zoning regulation is part of a coordinated program by the states of Washington and Idaho to improve ground-water quality along their shared border. Another example is the designation of lands unsuitable for coal mining. Most of these land use decisions have been made on the basis of surface and ground-water protection.

RESPONSE TO QUESTION 11:

Given limited fiscal resources the priority programs and activities in these bills that should be funded concern determination and mapping of aquifer boundaries, yield, quality, vulnerability, and recharge and discharge areas; determination of the health effects of contaminants, including relative risks assessments, and research on fate and transport of contaminants.

RESPONSE TO QUESTION 12:

Two exemplary state programs are discussed in AMC's enclosed white paper entitled "Ground-Water Management: Federal & State Roles."

The American Mining Congress appreciates the opportunity to respond to this questionnaire. Any questions concerning our responses may be directed to AMC Vice President Doug McAllister at (202) 861-2878.

Sincerely,

John A. Knebel

John A. Knebel
President

Enclosures

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1920 N Street N.W.
Washington, D.C. 20036
202/861-2800

TWX 710/822-0126
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* Immediate Past Chairman
† Honorary

June 1, 1988

The Honorable Daniel Patrick Moynihan
Chairman
Subcommittee on Water Resources, Transportation,
and Infrastructure
United States Senate
Washington D.C. 20510

Dear Mr. Chairman:

The American Mining Congress (AMC) appreciates your interest in ground-water protection and the equity with which you have conducted your subcommittee's ground-water hearings. At the conclusion of the hearing on March 24, 1988, you requested that AMC prepare a short paper on why federal ground-water standards are unworkable. This letter responds to your request.

As we stated in our testimony, the states are much better suited than the federal government to take primary responsibility for protection and management of the ground-water resource. The two main reasons for this are the localized nature of ground water, which does not lend itself to uniform federal regulations, and the inseparability of land- and water-use decisions involving site-specific considerations best handled at the state and local level.

Ground water does not exhibit uniform characteristics. In many ways it is a localized medium, subject to local variations in quantity, quality and importance relative to other competing demands of the community. Ground water varies substantially from area to area depending upon geographic, geologic and climatic conditions. Its natural background quality varies for similar reasons. Its importance as a resource also varies substantially from area to area depending upon current and expected population density, the availability of alternative resources and the nature and importance of potentially conflicting land uses.

The above-described diversity in the ground-water resource is accounted for in differences among state laws controlling the allocation of water rights and the protection of water quality. The differences are not random, but reflect the needs and desires of the states based on their own unique circumstances. National uniform regulations could not provide the flexibility necessary to account for local and regional variations and conditions.

In this regard, Florida's experience with ground-water standards is instructive. Florida initially proposed a standard of one part per billion (1 ppb) for benzene. Instead of finalizing this standard, however, Florida adopted a "target level" for benzene of 1 ppb.

Benzene is a common chemical in nature. It occurs in meats, vegetables and fruits, including apples and strawberries, and petroleum products such as gasoline. Benzene has been shown to cause cancer in laboratory animals and is a suspected human carcinogen. Spills of gasoline, even in small quantities, can result in soil or ground-water contamination well in excess of 1 ppb. Consequently, when such spills occur, man's ability to clean up the contamination becomes an issue. What is to be done if technology cannot achieve the standard? The answer that was reached in Florida was not to set a standard but rather to set a target level.

A target level is the clean-up level that the operator tries to achieve. If this level cannot be reached using reasonable technology, then clean up continues until an asymptotic level is achieved. This is a level at which further cleanup efforts do not appreciably lower the concentration of the contaminant in the ground or ground water. The target approach makes more sense than does use of a standard, which would require every bit of soil contaminated with 1 ppb to be taken to a secure landfill. This is true particularly when landfill capacity is at a premium, and transport of the contaminated material may pose a greater risk than leaving it in place.

Had it relied on a fixed standard, Florida would have lost much administrative flexibility. The result would have been the squandering of resources to achieve an outcome that is only slightly better in terms of contamination, and perhaps worse in the context of waste and resource disposal, than the results of the current program. Federal standards have not previously allowed for such flexibility as demonstrated by the continuing "how clean is clean" debate.

Despite the loss of state flexibility through national standards, some policy makers advocate the setting of national uniform standards, if for no other reason than to insure that ground water throughout the nation is protected to a baseline or minimum level.

One of the most likely results of such a uniform national approach is overinclusive regulation that imposes unreasonable burdens in site-specific situations. For example, if a set of national ground-water standards were to be developed, a definition of the word aquifer would be required. It would seem reasonable to assume that something as simple as an aquifer could be defined at the federal level. Unfortunately, the national experience with this simple concept illustrates why a comprehensive federal program is impossible.

In an effort to protect ground water from the improper disposal of wastes via wells, Congress passed the Underground Injection Control (UIC) amendments to the Safe Drinking Water Act. In that legislation, Congress defined a potential underground source of drinking water to be any ground water with less that 10,000 milligrams per liter (mg/l) of total dissolved solids (TDS). This TDS concentration level was chosen because technology exists to clean up ground water of this quality for use as drinking water. EPA has taken the 10,000 mg/l number from the UIC program and included it in the definition of an aquifer in the agency's National Ground-Water Strategy. Studies indicate that ground-water quality in most of the country is better than 10,000 mg/l TDS.

Additionally, EPA has determined that any well that is capable of serving three people must be in an aquifer. About 50 gallons of water are used by the average person per day. By this definition, therefore, a well that will produce 150 gallons per day (1/10 gallon per minute), regardless of depth, is in an aquifer.

The result of combining these two parameters (10,000 mg/l TDS and a yield of 150 gallons per day) means that almost everything is an aquifer and a potential source of drinking water. Such a definition is overinclusive. If national uniform drinking water standards were applied to all aquifers fitting this definition, absurdity would result. For example, clay, which is thought of by hydrogeologists as a barrier to groundwater flow and is used in well seals and hazardous waste landfill liners because of its low permeability, would be considered an aquifer containing potential drinking water. This is because it is possible to drill a well into clay and obtain the 1/10 of a gallon of water per minute that is required to meet the EPA definition. AMC is concerned that such overinclusive, uniform definitions and standards will not allow for basic activities such as mining, farming, highway salting and even septic tanks.

In addition to the danger of overinclusive regulation, there is the liklihood of unrealistic application of standards that were designed for application in other contexts.

Under authority of the Safe Drinking Water Act, EPA sets national drinking water standards that public water systems must meet in protecting the water we drink from the taps in our homes. AMC supports these standards as necessary for the protection of public health and as good yardsticks for determining if water is safe to drink.

Some reason that if drinking water standards set parameters for water that is safe to drink and ground water is a source for much of the nation's drinking water, then why not apply drinking water standards to ground water. This will insure that ground water will remain free from contamination.

Despite the logic of this approach, it does not reflect reality. National ambient ground-water standards are unworkable given the natural variation in ground-water quality. The concept falsely assumes that natural ground water is pristine and must be preserved at a level of quality that will meet national health-based standards.

In reality, all ground water is not naturally of drinking water quality. The Edison Electric Institute, in a commissioned study, recently evaluated the water quality of over 122,000 wells nationwide. The data were obtained from WATSTORE, the USGS data base, and sorted into different classes based on the depth of the well. The class that represents the most common domestic well is the 0 - 100 foot depth class. There are 82,084 such wells in the data base.

As a result of this analysis, it was learned that 12.3% of all wells less than 100 feet in depth exceed the secondary maximum contaminant limit for chloride. Similarly 21.6% of these wells exceed the primary drinking water standard for nitrate, 3.8% exceed the primary drinking water standard for chromium, and 50.6% exceed the secondary standard for iron.

According to the authors, these findings are conservative.

> The findings from this study consistently underestimate the actual amount of ground water exceeding drinking water standards. This underestimation arises from two factors: (1) many estimates were based on data from drinking water supply wells which, by their very nature, are strongly biased towards the best quality water; (2) most other estimates were based on the WATSTORE data base, which due to the preponderance of relatively shallow, private wells in the data base, is also biased towards good quality water.

The authors of the report conclude:

> The parameters that are most frequently exceeded are, in descending order, iron, total dissolved solids, sulfate, chloride, nitrate, and chromium.
>
> . . . .
>
> These data clearly suggest that, conservatively, the natural quality of almost 60 percent of the nation's ground-water resources above a depth of 2,500 feet does not meet all drinking water standards. This is contrary to the commonly held perception that the nation's ground-water resources are naturally pristine and of high quality.

The pollutant parameters in the study are all naturally occurring constituents of ground water. In some cases the chloride and nitrate levels have been increased by man's activity, but elimination of this influence would not alter the fact that a significant percentage of shallow wells produce water that does not achieve drinking water standards. This study did not include a number of additional inorganic chemical parameters that also influence the suitability of ground water for drinking water.

Application of drinking water standards to ambient ground water would preclude many basic human activities. The contaminant sulfate provides such an example. Sulfate currently has a secondary drinking water standard of 250 mg/l. Sulfate occurs naturally in large parts of the country and at concentrations that can be well in excess of this standard. Under the Safe Drinking Water Act Amendments of 1986, Congress has required EPA to establish a primary drinking water standard no later than June of 1989. The primary health-related impact of sulfate is its laxative effect on people who are not accustomed to it. A large number of domestic and some public water supply wells have concentrations of sulfate in excess of 250 mg/l. Users of this water develop a tolerence to it.

Sulfate is a chemical species that is not easily removed from aqueous systems. Although it can be removed by barium precipitation or reverse osmosis, neither of these technologies offers a satisfactory solution. Barium precipitation generates a sludge that must be disposed. Reverse osmosis is expensive and requires the disposal of a concentrated brine.

Sulfate concentrations are affected by man's activites. Mining where sulfide bearing minerals are present can result in the formation of acid mine drainage, and agricultural irrigation practices can result in sulfate concentration in arid soils. Current regulations for mining require that the acid is neutralized and the metals are removed. However, issuance of a primary drinking water standard for sulfate may spell trouble for farmers and miners given the limited removal technology options.

If the standard is used as a health-based standard, then there can be little argument with its value. However, if the federal government seeks to create a discharge or ambient groundwater standard for sulfate then there will be significant impacts both on industry and individuals.

Nitrate is another contaminant that it makes sense to regulate in drinking water at the tap but not through ambient standards applied in the ground.

Consider a domestic well on a farm that has excessive nitrate levels. Several options exist: (1) the well could be condemned; (2) the farmer could be made to restore the aquifer; (3) the farmer could be advised of the potential health risk; and/or (4) the farmer could be advised how to reduce nitrate levels in his water supply.

Nitrate contamination in a rural setting is normally due to a local source. The presence of elevated levels of nitrate in a rural well may, in fact, be due to several sources, and two of those sources are potentially more life-threatening than the nitrate: the septic tank at the farmstead and nearby livestock operations. The presence of nitrate may indicate that drainage from the septic tank leach field or livestock area is getting into the well. If this is the case, bacterial contamination of the water supply is a likely result. Such contamination can lead to infectious hepatitis, typhoid or other water born diseases. Other major sources of nitrate include fertilizer storage, fertilizer application and nitrogen fixing plants.

The major risk posed by elevated nitrate levels is the induction of methemoglobinemia, primarily in infants. Methemoglobinemia occurs when nitrate is oxidized to nitrite. Nitrite oxidizes hemoglobin in the blood to methemoglobin, which does not transport oxygen. This condition can be prevented by removing the source of the nitrate and can be easily treated, in acute cases, with an injection of methylene blue if properly diagnosed.

EPA data shows that between 1971 and 1986 (the latest year data is available) there was only one death from methemoglobinemia. Based on the rarity of the disease, and the ease with which it can be prevented and cured, it is obvious that draconian measures are not required. A program of well testing and education can deal efficiently with the health risk as well as reducing any continuing source of ground-water contamination. Condemning the well or bankrupting a farmer will not serve the individual, the community or the country. In this example the primary drinking water standard for nitrate is not used as an ambient ground-water standard but rather as a health standard for which it is properly suited. If it had been used as an ambient standard, the elevated level of nitrate in the ground water would constitute a violation that would require removal and treatment of the contaminated water.

Besides the failure of ambient ground-water standards to consider natural ground water quality and variation in the resource, such standards are ineffective as protection tools because they function only after the contamination has occurred. The contamination of rural wells by pesticides provides an example.

Ground-water contamination of rural wells by pesticides can occur by two principal routes. Either through the proper application of the compound, or through spills and the improper disposal of excess material, containers or rinse water.

Prior to application, the pesticide must be mixed, usually with water. This provides an opportunity for the concentrated product to be spilled. Once application is complete any remaining mix must be disposed of and the equipment rinsed. The farm well is usually the water source for both the mixing and the cleanup. Because of the concentration of the compounds and the typical proximity of mixing and cleanup operations to the farmstead, this vector is more likely to result in high level contamination than is the proper application of the compound.

With respect to this source of ground-water contamination, federal ground water standards will fail to modify the behavior of individuals until after the damage has occured. Source controls can address this type of contamination but are exceedingly difficult and costly to administer at a level which, in essence, requires the general public to obtain permits. The method that has worked in the past for this type of problem is one of education.

Contamination resulting from the improper use of pesticides is very similar to the problem of soil erosion that developed because of improper farming practices. The response at that time was to show the farmer how he could protect the land on which he was dependent. The response today should be to show the farmer and others how to properly handle and dispose of these materials. We already have the infrastructure in the form of the Soil Conservation Service and the Land Grant Colleges by which this information can be disseminated. What is needed is the development of procedures and practices that can be included in training programs.

The environmental community, industry and government all agree that prevention of ground-water contamination, where possible, is preferable to cleanup. The major disagreement among these groups is how prevention is to be accomplished. Rather than applying federal standards, such as ambient standards, that detect contamination but do not prevent it, a better option is to implement a program that prevents the contamination from occurring.

An appropriate approach can be drawn from the Clean Water Act's Spill Prevention Control and Countermeasure program (SPCC). In this program, a facility operator is required to develop a plan to prevent spills from contaminating surface water. The operator prepares the plan in accordance with published guidelines, and failure to have a plan can result in a fine.

This concept, applied to ground water is known as a Ground-Water Protection Plan (GWP plan). Under this program, an operator would be required to look at his facility, identify potential sources of ground-water contamination and develop and implement a plan that eliminates or minimizes the risk to ground water. Failure to have a plan would result in a fine. These plans could include physical modifications to the facility, use of less toxic materials, use of best management practices and plans for response to emergency conditions. Because of the site specificity of the approach, the number and diversity of activities having the potential to contaminate ground water, and the number of ground-water uses, this program should be implemented at the facility level and administered and enforced by state and local governments. The federal government could issue national guidance and technical information for effective GWP plans.

The benefits of such a program are numerous. Our experience with the SPCC program has been that it is effective at preventing accidental releases and reducing risk of contamination to surface water, while at the same time not requiring large financial burdens on either the government or the regulated community. This is particularly important at a time when federal and state resources are over extended. In addition, this program allows small businesses, such as dry cleaning operations, to reduce the possibility of contaminating ground water without causing adverse financial impacts. Another benefit is an increased level of education about the importance of ground water and how its contamination can be avoided.

Mr. Chairman, national uniform ground-water standards may seem appealing and necessary to create a base level of protection throughout the country, but in practice they are inherently unworkable. Such standards do not provide the flexibility needed to account for local and regional variations in the quality and relative importance of the ground-water resource. They result in overinclusive regulation or the misapplication of standards in a context other than that for which they were designed (e.g. tap standards applied to water in the ground). In either case the result imposes unreasonable burdens in site-specific situations and threatens basic activities such as agriculture and mining.

Finally, such standards do not protect ground water, they only function after the contamination has occurred. A better approach would be the use of Ground-Water Protection Plans, similar to Spill Prevention Control and Countermeasure Plans. Such plans, developed by operators on a site-specific basis with the help of federal guidance and administered and enforced by state and local governments, would operate to prevent ground-water contamination without imposing the burdens attendant to national uniform standards. In addition, educational programs should be developed to inform farmers and others of how ground water can become contaminated and how to prevent or minimize such contamination.

Thank you for giving AMC this opportunity to provide additional views on the ground-water standards issue.

Sincerely,

Douglas E. McAllister

Douglas E. McAllister
Vice President

NEDA
GROUND WATER PROJECT

Roger Strelow, Project Chairman
John Quarles, Vice Chairman and Counsel

National Environmental Development Association • 1440 New York Avenue, NW, Washington D C 20005 • (202) 638-1230

Testimony Presented By

Roger Strelow, Vice President, General Electric
and
Chairman, NEDA Ground Water Project

Concerning

S. 20, S. 1105, and H.R. 791

Before

Subcommittee on Water Resources, Transportation & Infrastructure
and
Subcommittee on Hazardous Wastes & Toxic Substances

Senate Committee on Environment & Public Works

March 24, 1988
10:00 a.m.
406 Dirksen Senate Building

Thank you for this opportunity to testify today on S. 20, S. 1105, and H.R. 791 -- three bills which reflect the growing consensus that the Nation needs a new and more effective commitment to protect our important ground water resources. I am Roger Strelow, Vice President of GE for Environmental Programs. I am appearing today as Chairman of the Ground Water Project of the National Environmental Development Association. NEDA is a coalition of industrial, agricultural and labor interests. The Ground Water Project includes members from the electronics, food, chemicals, mining, construction and petroleum production and refining sectors.

In view of the widely varying nature of ground water resources and the activities that affect them around the country, NEDA has, since 1985, been calling for a new partnership between the federal government and the states to deal with ground water quality. We, along with groups such as the National Research Council, the Environment and Energy Study Institute, and the Conservation Foundation, have been urging increased federal support for state ground water protection programs, while emphasizing that the states must retain their primary role in the regulation of ground water quality and quantity.

RCRA, CERCLA, and the Safe Drinking Water Act are all ground water protection programs. In view of these major federal regulatory and enforcement programs already in place, NEDA believes that two additional ingredients are needed to form the new federal-state partnership we advocate:

- expanded federal assistance to the states -- technical and scientific support as well as financial aid; and

- improved state regulatory programs tailored to meet the conditions and needs of each particular state.

Turning to the bills before the Subcommittees today, we strongly support H.R. 791, which would effectively address the need for improved federal information and assistance to the states. We view S. 20 as a positive step towards recognizing the state primacy and flexibility that we believe are necessary with regard to regulatory programs. We would like to suggest some improvements and clarifications. S. 1105, in our view, is fundamentally flawed because of its unjustified and unbridled authorization for the federal government to order private sector toxicology testing. I will briefly address each of these bills in turn.

H.R. 791

H.R. 791 seems well designed to meet the states' needs and to balance the federal and state roles in ground water protection.

H.R. 791 is a carefully-crafted bill that identifies the various types of research and information that state ground water regulatory agencies needs, and seeks to ensure that the federal agencies having the appropriate expertise -- EPA, Interior and Agriculture -- work in a coordinated fashion to supply it. The bill's scope is comprehensive and its assignment of responsibilities is sensible.

Attached to this statement is my letter of last year to Congressman Madigan of the House Health and Environment Subcommittee supporting H.R. 791.

S. 20

S. 20 has many positive features that we commend. It recognizes the need for greater state primacy and flexibility than has been the case in the federal-state environmental regulatory programs fashioned in the 1970s. It recognizes the multiple uses of ground water and the fact that not all ground waters can or should be designated for the same uses or subjected to uniform standards. (We would emphasize that this is particularly true of ground water that is briny or contains other natural impurities to an extent that limits or prevents its useability for drinking water or other purposes.) The bill calls for appropriate federal technical guidance in providing criteria for state standard-setting, and it recognizes the need for federal financial assistance to help the states build and improve their programs.

We do have some concerns about certain aspects of the bill where we would suggest clarification or changes. We offer these constructively because we feel the goals and basic approach of the bill are very positive.

- o We have two concerns with respect to the bill's provisions for state standard-setting:
  - First, the provision in section 5(d)(1) that very properly gives states the task of establishing procedures and methods for determining compliance should be expanded to recognize that ambient standards are difficult and costly to apply aquifer-wide and instead should be focused on locations where human exposure or environmental impact are likely. This could be done through applying standards at points of use and in wellhead protection areas, and by strict controls on new discharges, in order to minimize future contamination.
  - Second, the presumption in favor of drinking water standards should be changed because it could present states with a politically difficult challenge to deal realistically with waters that may not be suitable for such use. The language in subsection 5(b) should be the general criteria for standard-setting, with the proviso that where the use designation includes drinking water the state's standards should conform with applicable federal primary drinking water standards.
- o The provision in section 9 for a state to waive ground water protection program elements not needed in its jurisdiction is a vitally important means to allow states to focus on the real problems they confront rather than arbitrarily satisfying some

exhaustive federal checklist. Given the long-established Congressional and EPA proclivity to demand considerable uniformity from states in other environmental programs, it would be essential to make very clear with regard to these waivers, and with regard to the companion provision for EPA assessments of state programs, that considerable deference must be given to state judgment.

o The bill commendably applies state standards to federal ground water protection programs. But this should not preclude reasonable alternatives, for example in situations where full restoration of an aquifer may not be feasible.

o The section 10 authorization for grant funds is substantial, but it only begins to cover the costs of the many activities expected of states under the bill. This understandable Congressional frugality in an era of mounting budget deficits makes it even more important that the states have maximum flexibility to use these funds and their own resources in a manner which targets their most pressing needs.

This is a point that should be recognized with respect to all the bills before the Subcommittees today. In this time of budgetary stringency, there is a real danger that Congress will pass demanding regulatory measures but provide funding that is suitable only for a far more modest program. We agree with EPA Administrator Lee Thomas who urged just a month ago that Congress not impose new burdens on federal or state agencies that it is not prepared to realistically fund. Congressional enactment of the Wellhead Protection Program, and its subsequent failure to fund it, is a case in point.

S. 1105

This bill, which has been appended to S. 20, should be removed from it. H.R. 791 is a far preferable vehicle for improving and expanding needed federal research and technical assistance to the states.

Moreover, S. 1105 contains a massive regulatory program, in section 104, that is unwarranted and unwise.

The reporting and registration requirements that would be imposed on chemical manufacturers and importers duplicate or expand the already extensive informational requirements in other federal laws such as CERCLA (as amended in 1986) and TSCA.

Of greatest concern is the sweeping authorization in section 104 for EPA, upon the initiative of the Director of the National Toxicology Program, to order chemical manufacturers and importers to undertake potentially costly testing of a wide variety of chemicals simply because they are "known to occur in the ground waters of the United States" or "have the potential to leach" into ground waters. Unlike the already ample authority contained in section 4 of TSCA for EPA to require testing, there is no prerequisite that risk to the public be known or even reasonably anticipated. There is no requirement that the testing would facilitate remedial or protective programs relating to ground water.

Under TSCA and CERCLA, EPA and the Agency for Toxic Substances and Disease Registry have ample authority to obtain toxicological data needed to protect public health and the environment. We strongly oppose the enactment of S. 1105, which would impose massive new burdens on U.S. industry without any demonstrated justification.

###

My remarks have been made in an attempt to provide constructive assistance to the Subcommittees. NEDA would be pleased to provide any further information or suggestions that may help the Subcommittees determine what legislative or other steps might best advance the new federal-state partnership that is needed to complement existing ground water protection laws.

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NEDA
GROUND WATER PROJECT

Roger Strelow Project Chairman
John Quarles Vice Chairman and Counsel

National Environmental Development Association • 1440 New York Avenue NW Washington D C 20005 • (202) 638-1230

September 16, 1987

The Honorable Edward R. Madigan
Ranking Minority Member
Health and Environment Subcommittee
Energy and Commerce Committee
U.S. House of Representatives
2312 Rayburn Building
Washington, DC 20510

Dear Mr. Madigan:

I am commenting on behalf of the National Environmental Development Association (NEDA) Ground Water Project on the September 11, 1987 draft of a substitute for H.R. 791, now entitled the "Ground Water Research Act of 1987." The Ground Water Project is a coalition of industrial, agricultural and labor interests. The industries represented include food, chemicals, construction, electronics, mining and petroleum production and refining. We are users of ground water. Our livelihoods and our future growth depend on the continuing availability of ground water for a wide variety of uses. Many of our members are also regulated to help protect ground water. We believe this gives us a balanced perspective on these issues.

The management and protection of ground water quality and availability must be a high national priority. NEDA believes that it is the proper role of the Federal government to provide technical and scientific support to states and local governments who have primary responsibility for ground water protection and management programs. Because of the variation in ground water resources throughout the country, no single strategy will be universally effective. Thus, the state-specific information developed under the proposed bill will provide the foundation for various state and local prevention and remediation strategies.

In its recent report, "Ground Water Quality Protection: State and Local Strategies," the National Research Council concluded: "Protection of ground water requires a sound and appropriately designed hydrogeologic information base to determine on a continuing basis what ground water problems may exist. Data are also needed to predict future threats." The proposed Bill expands the existing federal ground water research and monitoring programs and initiates a development and demonstration program, affirmatively responding to the NRC observation.

NEDA supports the flexibility inherent in the proposed bill, as well as the particular designations of lead agencies that are provided. For example, USGS is a good choice to lead the National Ground Water Characterization Program (its parent agency, the Department of the Interior, is named) and EPA is the appropriate lead agency for the National Research, Development and Demonstration Program for Water Protection and Management.

In addition to expressing our support to the basic approach taken by the current draft of the bill, we want to point out two areas where the opportunity for improvement exists:

- The 270-day deadline for the initial report of National Ground Water Characterization Program is unrealistic. A more realistic draft completion date would be 18 months, with a report to Congress due in 24 months after enactment. Obviously, the completion time for establishment of a program in Section 5(c) should be correspondingly adjusted.
- Industrial projects should be explicitly included under Section 6(a)(3) as possible candidates for technical assistance.

NEDA is pleased to submit these initial comments on the proposed bill and we look forward to working with you and the Committee as it continues its consideration of the legislation.

Sincerely,

Roger Strelow

Chairman
NEDA Ground Water Project

Vice President
Corporate Environmental Programs
General Electric Company

cc: The Honorable Henry A. Waxman, Chairman, Health and Environment Subcommittee
The Honorable John D. Dingell, Chairman, Energy and Commerce Committee
The Honorable Norman F. Lent, Ranking Minority Member, Energy and Commerce Committee

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NEDA
GROUND WATER PROJECT

Roger Strelow, Project Chairman
John Quarles, Vice Chairman and Counsel

National Environmental Development Association • 1440 New York Avenue, NW, Washington D C 20005 • (202) 638-1230

April 26, 1988

DISCUSSION PAPER

Federal Role in Ground Water Management

Factors that impact on ground water such as geography, geology, hydrogeology, climate, industrial and agricultural activities, and population vary from state to state. Ground water contamination sources differ among, and even within, regions. In addition, states have different needs for their ground water, different requirements for protection based on these needs, and different ground water quality. For these reasons, the primary responsibility for designing and carrying out the elements of ground water management programs should remain with the states and local governments. The federal government can play an important supportive role to provide the necessary technical and financial underpinnings for the state and local programs.

Federal involvement in the management and protection of ground water should provide:

- Standards-setting for drinking water;
- Ground water protection and remediation under existing federal laws;
- Criteria for the development of ground water monitoring, sampling, modeling and clean-up;
- Methodologies for ground water monitoring, sampling, modeling and clean-up;
- Assistance in the identification of control technology and clean up technology applications to ground water management;
- Arbitration of interstate disputes concerning ground water quality of withdrawal.

(please turn)

A supportive federal role is necessary because of the complexities of ground water contamination and remediation, the sophisticated technical resources and expertise in federal agencies, which many states do not have, and data which the Federal Government has or could obtain more efficiently that the states. An appropriate federal role would include providing technical assistance to states on safe levels of contaminants for certain uses and providing technical assistance on ground water monitoring, sampling and on laboratory and analytical techniques.

With regard to ground water management, the Federal Government can provide much needed technical and fiscal assistance to states, while leaving regulatory matters and site-specific ground water protection issues to states and local governments where they can be most appropriately addressed.

(NEDA):NE5019LAZ

NEDA
GROUND WATER PROJECT

Roger Strelow, Project Chairman
John Quarles, Vice Chairman and Counsel

National Environmental Development Association • 1440 New York Avenue, NW, Washington D C 20005 • (202) 638-1230

April 29, 1988

The Honorable Daniel Patrick Moynihan
Chairman, Subcommittee on Water Resources,
Transportation and Infrastructure

and

The Honorable Max Baucus
Chairman, Subcommittee on Hazardous Wastes
and Toxic Substances
Committee on Environment and Public Works
United States Senate
Washington, DC 20510

Dear Senators:

Enclosed are the responses of the National Environmental Development Association's Ground Water Project to the questions included with your letter of February 25, 1988. The Project is submitting these responses to supplement our March 24 testimony before your subcommittees.

The Ground Water Project appreciates the opportunity to testify before the subcommittees and to respond to these questions. Should you have any questions or require additional information about our testimony or the enclosed responses, please contact me at (203) 373-3067 or John Quarles, the Project's vice chairman and counsel, at (202) 467-7150.

Sincerely,

Roger Strelow

Roger Strelow
Chairman

Enclosures
(GRND) GW1117LAZ

April 29, 1988

NEDA GROUND WATER PROJECT

RESPONSES TO GROUND WATER QUESTIONNAIRE

The following statements were prepared in response to a list of questions posed by the Senate Subcommittee on Water Resources, Transportation and Infrastructure and the Subcommittee on Hazardous Wastes and Toxic Substances in a letter dated February 25, 1988.

Question #1

Is there a need for federal ground water legislation or are other federal statutes adequately addressing this need? (esp. SARA, RCRA, SDWA, CWA)

NEDA supports the enactment of legislation which would increase federal support for state ground water management activities, such as H.R. 791, which is now awaiting Senate action. The states need increased technical assistance to provide scientific information and criteria for state standard-setting and to improve monitoring and sampling methodologies for assessing ground water and the sources of contamination. Increased financial assistance for states is needed for these activities as well as for state collection and dissemination of information to the public.

NEDA/Ground Water supports the Federal role under existing laws for remedying ground water contamination and for protecting ground water used as drinking water. The wellhead protection program under the Safe Drinking Water Act has not been funded and we support legislation to provide adequate funds for this and other federal ground water-related research, development and regulatory programs under numerous federal laws already in place.

We do not see the need for new federal regulatory programs or specifications for state ground water programs since the need for different program elements will vary tremendously, not only among the states, but within many of the states, as well.

-Would a federal statute weaken other existing federal programs for ground water?

A federal statute along the lines of H.R. 791 would not weaken, but assist the states in carrying out both their own ground water management programs and their responsibilities under existing federal programs that rely on the states for implementation.

-What efforts could be made to integrate and strengthen all these statutes?

Each state should designate a lead agency to develop, manage and coordinate the state's responsibilities under the federal programs already in place (e.g., RCRA, CERCLA, SMCRA, FIFRA and CWA), and the state's own ground water management initiatives.

The state lead agency should be responsible for coordinating activities with other agencies to assure that all are working toward a common goal. This function will avoid duplication of effort and inter-program disputes which are likely to arise since ground water decisions can potentially affect multiple community interests (residential zoning and waste disposal, agriculture, and industrial activities, etc.).

Question #2

Should the primary responsibility for ground water protection reside with the state and local governments, or should there be a national goal set by the federal government? If there is a national goal, which agency should set it and what should it be?

States and local government must continue to be primarily responsible for designing and carrying out programs to manage their ground water resources. The national goal should be to protect ground water so that contamination will not interfere with current or future uses of states' ground water resources.

Factors that impact ground water, such as the availability and demand for ground water, geography, hydrogeology, climate, agriculture, industry and population, vary from state to state. States must continue to protect ground water resources to best accommodate their unique conditions and the multiple uses of the resource. As sources of ground water contamination also tend to be defined by local conditions, each state has different ground water problems and requires a customized solution for both protection and remediation efforts. Because of the diversity of state circumstances, it would be difficult to design and implement a uniform regulatory approach that would work well under the diversity of factors that need to be weighed on a state-by-state basis.

Should there be a strict federal nondegradation policy, a limited one or should the state decide on nondegradation?

The NEDA Ground Water Project believes that the meaning of the term "nondegradation" is often misunderstood by both policymakers and the public. True nondegradation, the absolute avoidance of the introduction of any foreign matter into ground water anywhere, cannot be achieved--for ground water or any other environmental medium. To enforce a nondegradation policy would result in total suspension of all human activities affecting ground water resources. It is, therefore, unrealistic to legislate a nondegradation policy and it would create public expectations that cannot be realized.

The most effective and realistic goal for state ground water management programs should be conservation of use--protection of current and potential uses of the resource-- and each state should design its ground water programs with this as their primary goal. Further, the use of the most effective technologies to control releases to ground water will minimize ground water degradation. This is a realistic goal for aquifers that have potential for productive use.

Question #3

Do you support federal ground water permits based on water quality criteria or federal source controls based on potential for ground water contamination? If so, for what sources?

There already are federal permits and other programs--under Superfund/CERCLA, RCRA, the Safe Drinking Water Act, the Clean Water Act, etc.-- to control sources and activities that have the greatest potential to threaten ground water. Additional federal ground water permit programs and federally-mandated source controls would be inconsistent with a state's primacy over its own ground water protectio n programs.

States should be responsible for developing any facility controls by issuing permits for particular categories of sources of contamination and by controlling some pollution sources such as septic tanks, road salting and agricultural practices to prevent contamination from occurring. Based on the state's assessment of its resources they may need to implement controls on discharges and other contamination sources on a case-by-case basis with sensitivity to local needs, institutions and political mechanisms.

Question #4

How should the activities of the federal agencies be coordinated--by a committee designated by statute, a statutorily-designated lead agency, or should this be the responsibility of the President?

NEDA Ground Water believes that the President should be responsible for coordinating the activities of the federal agencies with regard to ground water programs, as outlined in H.R. 791. The addition of a new layer of bureaucracy would not be helpful and statutory designation limits fexibility that may be needed in the future.

Please consider whether there should be one lead agency for research and another for regulation.

The Project believes the Environmental Protection Agency (EPA) should have a lead role in research on the effects of contaminants on human health and the environment and on technologies for the mitigation and prevention of ground water contamination. The United States Geological Survey users should continue to have the lead with regard to hydrogeology, monitoring, modeling and assessing ground water resources.

The EPA is the lead agency for regulation under existing laws and we see no need to change this arrangement.

If there were to be a federal entity to coordinate research among the agencies, is there an existing suitable entity? (e.g., FCCST, the Federal Coordinating Council on Science and Technology, FCCST)

NEDA/Ground Water has no specific recommendation on which a federal entity should coordinate research among the agencies.

Question #5

For each of the following functional activities, describe the role you see each of the various federal agencies play (including the funding and institutional arrangements,

where appropriate) regardless of whether you approve of the function itself being carried out by the Federal government.

a. Approving state plans for assessment, monitoring, protection or management

Should a federal statute require it, EPA is the federal agency that should be responsible for approving state plans for assessment, monitoring, protection or management of ground water resources. It would be more appropriate, however, for an established state lead group to be responsible for disapproving and amending these state ground water management plans.

b. Providing technical assistance on matters of hydrogeology, resource assessment, resource management, mapping of aquifers or recharge areas, or data management

c. Providing technical assistance on matters of health effects, criteria setting, mitigation strategies or remediation strategies

**d. Operating an information clearinghouse providing the indexing of data, of literature (technical and lay), and of sources of expert advice and services to state and local government, i.e., conducting research on hydrology,
hydrogeology, fate and transport of chemicals in the subsurface, monitoring-network design**

e. Conducting research and development on techniques for preventing contamination from: agriculture, domestic waste disposal, industry (including extractive industries) and other sources

f. conducting resource assessments

g. Conducting research on health and ecological effects of contaminants

h. Conducting research and development on methods of remediation and treatment of contaminated ground water

i. Issuing health advisories

The following is in response to questions a-i:

NEDA/Ground Water supports H.R. 791 as it is a carefully crafted bill that identifies the various types of research and technical assistance that the states need, and seeks to ensure that the federal agencies with the appropriate expertise work in a coordinated manner to supply it. As specified in H.R. 791, USGS should be the federal agency providing technical assistance on matters such as hydrogeology, resource assessment, resource management, mapping of aquifers, recharge areas and data management. With more federal financial assistance, the USGS should be able to conduct more research on hydrology, hydrogeology, fate and transport of chemicals in the subsurface and monitoring-network designs and make this information available to the states through a clearinghouse.

EPA has more technical expertise in the areas of health effects and mitigation/remediation strategies and is appropriately designated as the federal agency with these responsibilities in H.R. 791. EPA should continue to conduct research and development programs aimed at prevention of contamination, including that resulting from industrial practices, agriculture, mining and domestic waste disposal. Further, EPA should continue to conduct research on health and ecological effects of contaminants as well as continue R&D activities on methods of remediation and treatment of contaminated ground water.

Question #6

How should the needed university research and educational programs related to ground water research be strengthened (e.g., institutes, fellowships, competitive research grant programs) and how should these programs be administered?

-The Water Resources Research Act (P.L. 98-242) is authorized through 1989. This Act funds 54 research institutions on a 40/60 federal-state matching basis. How can this program be incorporated into the new ground water bills?

The NEDA Ground Water Project has taken no position on university research and educational programs related to ground water research or how these programs should be administered.

Question #7

Comment on the USGS National Water Quality Assessment Program and how that relates to any of the assessments and studies in S. 20, S. 1105, and H.R. 791.

-Are the time frames for these assessments and studies reasonable?

The NEDA Ground Water Project has no comment on the USGS National Water Quality Assessment and how it relates to S. 20, S. 1105 or H.R. 791.

Question #8

Comment on EPA's classification scheme and how it relates to each of the three bills.

NEDA/Ground Water favors comprehensive use classification and believes that it should be the major focus of any ground water protection program. Without efforts to classify ground water according to use, both protection and remediation will have to rely on goals expressed as ambient targets that do not relate to the actual potential for human exposure.

Although EPA's basic approach to classification is a good start as it recognizes that different ground waters warrant different degrees of protection, the scheme is overly simplistic and needs further refinement of the categories to reflect the many different gradations of current and potential uses of ground water. Using EPA's three classes, all of a state's ground water is likely to be classified as drinking water (often the temptation due to lack of state personnel and financial and technical resources), even where it is not actually used for that purpose or has the potential for such use.

H.R. 791 would provide the necessary funding and technical expertise to the states so that they can begin to assess and classify their ground water resources. H.R. 791 requires the establishment of a ground water information clearinghouse that could also provide states with the data they need to classify their resources.

S. 20, a comprehensive ground water protection bill, would require states to develop ground water protection plans and establish numerical standards. A classification scheme is necessary to develop state ground water protection plans and, using EPA's classification system as a starting point, states should assess and classify their own ground water resources by current and potential uses. However, states need not delay the development of protection and remediation programs in the meantime. Any imminent hazards and known problems should be addressed promptly under existing state or federal programs.

Question #9

To what extent should the federal government concern itself with ground water depletion--for research only? Regulation?

NEDA/Ground Water has not taken a specific position on ground water quantity issues. We recognize, however, that ground water quantity and quality issues are interrelated. State and local programs designed to protect ground water quality should, where necessary, integrate quality and quantity considerations. There is no useful federal role related to the regulation of ground water withdrawal, other than to continue to allow states the flexibility to resolve these issues appropriately. In some western states, for instance, competing demands on ground water continue to lead to friction among states; yet, absent any federal regulation, states have developed complex and effective legislation to ensure proper quantity and quality of ground water for all uses, including agricultural uses. However, states can be helped by the federal government's efforts to assess and map the resources and assist with state classification in addition to research activities.

Further, the federal government can provide a useful role by developing mechanisms for resolving interstate disputes.

Question #10

To what degree are states using land use controls to prevent ground water contamination?

The very limited information we have suggests that states do not presently use land use controls to any great extent to prevent ground water contamination. The states of Vermont and Connecticut, and jurisdictions in Long Island, New York, provide notable exceptions. (See Patrick, Ford & Quarles, Groundwater Contamination in the United States (2d Ed.) 1987 pp. 406-470, for discussion.

Question #11

Given limited fiscal resources, what are the priority programs and activities to fund in these bills?

Priority should be given to federal funding for research and technical assistance to support activities such as developing monitoring and sampling methodologies; collecting and disseminating information; and conducting research and providing scientific criteria on ground water contaminants. Such activities will allow the states to move forward with ground water protection programs.

Question #12

Please point out any exemplary state groundwater programs or add any other comments not covered in your statement.

Leading state programs are discussed in the National Research Council's Ground Water Quality Protection: State and Local Strategies, 1986, p. 23. The diversity of state ground water programs illustrates the difficulty of trying to impose a uniform, national regulatory approach.

Comments on S. 1105

The NEDA Ground Water Project is opposed to S. 1105, (also introduced as an amendment to S. 20) which is now under consideration by two Senate Environment and Public Works subcommittees. The bill, entitled the the "Ground Water Research Act", is not simply a research bill. S. 1105 would actually impose enormous costs on the government and industry and seriously misallocate the resources available to develop, assess and use data needed for ground water protection and remediation programs.

The Project is particularly concerned with section 104 of S. 1105, as it would creates a program of health-effects testing for ground water "contaminants" (defined in the bill to include natural contaminants as well as pollutants attributable to human activities) and require the manufacturers of such contaminants to bear the cost of testing demanded by the National Toxicology Program.

S. 1105 would significantly increase federal resources for research and technical support to state ground water protection and remediation programs and NEDA/Ground Water strongly supports increases in such support to the states. However, this provision of S. 1105 is so misguided that the Project urges opposition to the bill (and to S. 20, until S. 1105's provisions are deleted) in favor of H.R. 791. H.R. 791 similarly enhances federal support to the states, but it does not have S. 1105's deficiencies.

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STATEMENT
OF
THE NATIONAL WATER WELL ASSOCIATION
AND
THE ASSOCIATION OF GROUND WATER SCIENTISTS AND ENGINEERS

by

JAY H. LEHR

BEFORE

SUBCOMMITTEE ON WATER RESOURCES, TRANSPORTATION AND INFRASTRUCTURE

AND

SUBCOMMITTEE ON HAZARDOUS WASTES AND TOXIC SUBSTANCES

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

U.S. SENATE

MARCH 24, 1988

Good morning. I am Jay Lehr, Executive Director, of the National Water Well Association (NWWA) and the Association of Ground Water Scientists and Engineers (AGWSE). I thank the committee for the opportunity to testify on the important topic of ground water and specifically on S. 20, the "Ground Water Protection Act of 1987;" S. 1105, the "Ground Water Research Act of 1987"; and H.R. 791.

The National Water Well Association is a nonprofit professional society and trade association, representing all segments of the ground water industry. Its more than 14,000 members include some of the country's leading ground water geologists and hydrologists, water well drilling and pump installation contractors, engineers, manufacturers and suppliers of ground water-related products and services.

The National Water Well Association also manages the National Ground Water Information Center. The Center has operated, since 1978, through a cooperative agreement between the association and the U.S. Environmental Protection Agency. The Center maintains a physical collection of over 10,000 books, maps, research reports and other documents relevant to ground water development and protection. Ground Water On-Line, the Center's data base, has indexed over 45,000 documents, providing scientific researchers, governmental agencies and others a highly detailed bibliographic summary of ground water literature.

I have spent thirty-four years in the field of ground water science, beginning as an employee of the U.S. Geological Survey in Long Island, New York. Since that time, public awareness has swung from general ignorance and apathy over ground water to the high degree of concern we have today for ground water protection. In the last ten years, we have achieved dramatic progress in the recognition and assessment of the problem as well as in the development of new technologies with which to attack it. Congress has already enacted a significant network of laws to protect our ground water. These laws may not be a perfect safety net, but they focus everyone's attention squarely on the appropriate targets of effort. States and local governments have moved forward aggressively with innovative programs. Currently, 46 states have or are developing comprehensive ground water protection programs. Industry no longer reacts hostilely to ground water cleanup and protection programs but instead is trying to accomplish the very most they can, within a reasonable economic framework.

We have come a long way together. We may not have cleaned up all of our past mistakes -- nor perhaps should we, considering our limited financial resources and technology constraints --but we are doing more things right than wrong toward preventing future incidents of ground water contamination. Legislative proposals, such as those being considered today, advance our ground water protection efforts, in and of themselves, by providing a focus for debate. Whether or not additional federal legislation should be enacted is another question.

NWWA's Aquifer Protection Committee identified the following as points for your consideration:

1. Federal legislation should assist states in carrying out their ground water protection strategies, with maximum flexibility afforded to the states, counties and municipalities to address local needs.

In August 1984, the U.S. Environmental Protection Agency released its Ground Water Protection Strategy. The strategy recognized that states should have the principal role in ground water protection. This is appropriate both from the perspective of the historical and legal role states have played in land use planning and water allocation as well as from the hydrogeological aspects and the universe of potential contamination sources. States have responded positively to their role through development of comprehensive ground water protection strategies, often made possible through federal funding. Implementation of these strategies will require continued funding and time. The best opportunity for ground water protection lies at the county and municipal levels of government where the majority of land use control exists. Federal ground water protection efforts should reflect this.

2. Current federal program priorities and appropriations should be set with emphasis on resource protection.

High cleanup costs and rapidly evolving cleanup technology make restoration of ground water still expensive and uncertain at this point in time, though there is cause for optimism over our future capabilities. Given budget constraints, resource size and the scope of potential contamination sources, a present emphasis on prevention will yield more satisfying results. The wellhead protection program, which has been largely abandoned by Congress, is an example of such a preventative approach. Before we establish new legislative agendas, we should fulfill earlier promises and programs such as support for state implementation of wellhead protection programs.

3. Federal efforts should be directed toward increased research and demonstration projects to support sound scientific and policy decisions.

We are measuring ground water constituents in the parts per billion and even parts per trillion and setting standards at those minute levels. Such precision sounds truly impressive;

however, we are constantly aware that well design and construction materials, well placement, sampling techniques, and laboratory analytical capabilities can influence the results. Efforts are underway at the Environmental Monitoring Systems Laboratory in Las Vegas to develop methods for extracting truly representative ground water samples at lower costs. This research has broad application and interest to decision-makers at the federal, state and local government levels as well as to industry. Undertaking of such projects at the federal level is a wise use of our monetary resources and talent.

In regards to S. 20 and the setting of numerical ambient ground water standards, chemical-specific standards are very difficult to establish since there are literally thousands of compounds, and proof of harm to the environment or public health must be substantiated for each of these compounds. Congress and the public have both been frustrated with the slow pace at which drinking water standards have been developed. Similar frustrations are likely to be experienced in any effort to develop numerical ambient ground water standards.

Continued priority should be given by EPA to the development of health advisories and drinking water standards rather than ambient ground water standards.

4. Federal legislation is needed establishing an interagency committee to coordinate federal research efforts.

U.S. EPA, USGS and the Department of Agriculture, among others, do an excellent job with their ground water research programs, and their scientists should be commended. We believe, however, that the establishment of an interagency committee comprised of all federal agencies involved in ground water-related activities would provide a focal point for identifying research needs, recommending overall research priorities, and maximizing current institutional and research capabilities while avoiding duplication. An annual report to Congress would be a product of the committee and would also serve to emphasize to everyone the priority ground water has in the nation.

At the same time, it must be realized that these agencies already talk to each other and do serve together on interagency committees, thus the need is to strengthen existing bonds not reinvent them.

5. A mechanism for state input into federal research efforts is needed to assure the applicability and technology transfer of federal research efforts to state ground water programs.

State and local government officials are often the front line, assessing site specific ground water contamination cases or issuing construction permits for septic systems. It is, therefore, important that they be given the necessary tools to deal with these and other responsibilities. A committee, comprised of state and local ground water officials, who would provide input to the Interagency Committee early in the research planning process may be an appropriate coordination mechanism.

Aggressive technology transfer programs directed at state and local government officials would be a necessary follow-up to make sure that research results are known and applied where appropriate. Research results should also be made available through the appropriate component of the national ground water information clearinghouse (The clearinghouse is discussed further in a later section of this statement).

An additional factor must also be considered. As you are aware, there is a shortage of skilled scientific personnel in ground water today. New individuals have entered the field to fill this void. They are quickly trying to assimilate the necessary knowledge and skills that they need. Colleges and universities, professional societies and educational providers have all responded to this need with offerings and course development. We have seen a rapid increase in our membership and in participation in our educational courses. However, there will be some time lag before these entrants are up to full speed. This is not to say that we should not continue to spread the word about new technology and research results, but there is a basic educational foundation that must also be laid.

6. Federal legislation should be enacted establishing and funding a national ground water information clearinghouse. The National Ground Water Information Center in Dublin, Ohio should be an integral part of any such clearinghouse.

As indicated previously, nearly 45,000 documents are indexed to Ground Water On-Line, the National Ground Water Information Center's data base. This is an EPA-supported project as is STORET. WATSTORE and NAWDEX contain data gathered by USGS. Additional information sources are located throughout the country at state government offices and private research institutes. No one data source contains all the information. Most were established to meet specific program needs. Consolidation of existing data would be extremely expensive, unwieldy to format and duplicative of past efforts. Cataloging of sources, establishment of a network of users and providers, and provision for continued operating funds would provide an eclectic clearinghouse where each part would complement the other while still fulfilling their initial purpose.

The following remarks touch briefly on a few of the items in the committee's questionnaire:

Should there be a strict federal nondegradation policy, a limited one, or should the states decide on nondegradation?

While a nondegradation standard or zero discharge may be appropriate for certain contaminants, activities or in certain aquifers with high resource value and high vulnerability, it must be recognized that by their very nature some necessary activities introduce contaminants into the ground water as an unwanted side effect. Examples are farming, road deicing, and mining. In cases of this type, a balance must be struck between the societal value of the activity and ground water protection. Also septic tanks, injections wells and the like need to discharge pollutants to ground water as part of their intended function. In cases of this type, construction or performance permits can be structured so that unavoidable discharges are within appropriate standards. State discretion in recognizing these distinct instances and their input in making regulatory and management decisions is imperative. A strict federal nondegradation policy is impossible from a technical standpoint.

Do you support federal groundwater permits based on water quality criteria or federal source controls based upon potential for groundwater contamination?

There should be no increase in the current level of federal regulatory activity over ground water.

Comment on EPA's classification scheme and how it relates to each of the three bills.

Ground water is a resource that should be managed according to its value for beneficial uses. Aquifer classification should be based upon use classification or resource value, such as water supply or more discretely water supply use without treatment and water supply use after treatment. Moreover, a classification system should provide a basis for designating several subclasses of useable water, reflecting priorities for protection. High priority classes may include highly vulnerable areas based on hydrogeological characteristics, wellfield recharge areas or cones of influence, regional recharge areas, or the like.

It would not be appropriate to attempt to apply a uniform set of classification criteria across the nation because of the variation in climatological and hydrogeologic settings, water use and economic activity.

We stand at an enviable position on a critical path. We have an educated public that is willing to be led by our government and by our scientific experts. It's going to take a lot of money and a great deal of time to overcome our nation's ground water pollution problems; but having traveled so far up the learning curve, I am optimistic that the attainment of our goals can be permanently achieved in the foreseeable future. The Congress's continuous attention to these matters is a significant part of my cause for optimism. Thank you.

State of Utah
DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

Norman H. Bangerter
Governor
Suzanne Dandoy, M.D., M.P.H.
Executive Director
Kenneth L. Alkema
Director

288 North 1460 West
P.O. Box 16690
Salt Lake City, Utah 84116-0690
(801) 538-6121

March 21, 1988

Nan Stockholm
Majority Staff
Senate Committee on Environment
and Public Works
458 Senate Dickson Building
Washington, D.C. 20510-6175

Dear Ms. Stockholm:

Re: Ground Water Legislation

Enclosed find a copy of a recently adopted joint resolution of the Utah Legislature concerning federal ground water legislation. I request that this resolution be included in the record of the hearings being held on ground water legislation by the Senate Committee on Environment and Public Works.

Sincerely,

Dale [illegible]

Kenneth L. Alkema, Director
for Division of Environmental Health

Enclosure

cc: Western States Water Council

KLA:jgh

0830-48

MAR 1988
Received
Bureau of Water
Pollution Control

FEDERAL GROUND WATER LEGISLATION

1988

GENERAL SESSION

Enrolled Copy

S. J. R. No. 1 By Cary G. Peterson

A JOINT RESOLUTION OF THE LEGISLATURE URGING CONGRESS TO PROTECT THE STATES' PRIMARY ROLE IN GROUND WATER MANAGEMENT.

Be it resolved by the Legislature of the state of Utah:

WHEREAS, ground water is a critically important natural resource in Utah and historical policies have emphasized the primacy of states to manage this resource;

WHEREAS, Utah is in the process of establishing a comprehensive program for the protection of ground water quality;

WHEREAS, Utah has legal mechanisms to govern ground water allocation and there is widespread agreement that states should continue to have the exclusive responsibility to administer ground water rights;

WHEREAS, the federal role in ground water protection should be one of support for state programs; and

WHEREAS, a number of proposals for federal ground water legislation are currently being considered in Congress.

NOW, THEREFORE, BE IT RESOLVED that the Legislature of the state of Utah urge Congress in its consideration of national ground water policy to assure that any legislation that is enacted is faithful to and supportive of the primary role and responsibility of states in managing ground water.

BE IT FURTHER RESOLVED that a copy of this resolution be prepared and forwarded to the Vice-president of the United States, the Speaker of the United States House of Representatives, all members of the Utah Congressional Delegation, and the United States Secretary of the Interior.

American Petroleum Institute
1220 L Street, Northwest
Washington, D.C. 20005
202-682-8100

Charles J. DiBona
President

May 17, 1988

The Honorable Daniel P. Moynihan
Chairman, Subcommittee on Water Resources,
  Transportation and Infrastructure
Senate Committee on Environment
  and Public Works
Washington, D.C. 20510

Dear Mr. Chairman:

Although the American Petroleum Institute (API) was unable to testify during the second joint Subcommittee hearing held on March 24, 1988, regarding groundwater legislation, we are pleased to submit this statement for inclusion in the Committee record. Please also find attached to this statement, API's responses to the questionnaire prepared by the Subcommittees on Water Resources, Transportation, and Infrastructure and on Hazardous Wastes and Toxic Substances. We submit these for the record as well.

API is hopeful that the comments, concerns, and observations made in the attached materials will be of assistance to the Committee as you investigate the merits and problems associated with comprehensive federal groundwater legislation.

Sincerely,

Enclosures

STATEMENT ON BEHALF OF THE
AMERICAN PETROLEUM INSTITUTE

SUBMITTED TO THE SENATE COMMITTEE
ON ENVIRONMENT AND PUBLIC WORKS

SUBCOMMITTEE ON WATER RESOURCES,
TRANSPORTATION, AND INFRASTRUCTURE
AND THE
SUBCOMMITTEE ON HAZARDOUS WASTES AND TOXIC SUBSTANCES

MAY 16, 1988

The American Petroleum Institute (API) welcomes this opportunity to comment on S. 20, the "Groundwater Protection Act of 1987," and its amendment, S. 1105, the "Groundwater Research Act of 1987," also introduced as a separate groundwater research bill. API represents more than 200 companies and 5,000 individual members engaged in various aspects of oil and gas operations. The petroleum industry has a strong interest in any federal groundwater legislative initiative since our operations depend, in several functional areas, on groundwater resources across the country. We welcome the opportunity to comment on these legislative proposals.

API believes that there is no merit in federal legislation that would mandate prescriptive state groundwater programs and establish federal numerical standards. Furthermore, it is the belief of the Institute that the present federal and state groundwater management responsibilities, though not without flaws, already substantially protect the nation's groundwater resources. API supports the legitimate national interest in groundwater protection but also believes that the existing federal and state groundwater programs, when fully implemented, should adequately protect our groundwater resources.

For example, on the federal level, there currently exist some sixteen federal statutes having a direct impact on groundwater protection, and a number of additional statutes having an indirect impact. Some of these include the Clean Water Act; the Safe Drinking Water Act (in particular its Underground Injection Control Program, the Sole Source Aquifer Program, the Wellhead Protection Program, and its Primary Drinking Water Standards); the Resource Conservation and Recovery Act; the Toxic Substances Control Act; the Surface Mining Control and Reclamation Act; and the Superfund Amendments and Reauthorization Act. API believes that better coordination of these diverse existing federal programs and of the regulations established by the responsible federal agencies, would be a more effective objective to pursue at this time. Additional comprehensive legislation such as S. 20 and S. 1105 could result in duplication, inefficiencies, and confusion for the regulated community and for those states with existing groundwater programs.

Forty-eight states have put into place individual groundwater management strategies as a means of protecting groundwater resources and the health of their citizens. Over half of the states have implemented or are in the process of developing comprehensive groundwater programs. Therefore, a mechanism is already in place which allows states to protect their own groundwater resources. It is at this administrative level that the unique hydrogeologic properties, economic information on water supply and demand, and the multiple uses or beneficial uses of a specific groundwater resource are best known, monitored, and controlled.

In an August 1987 "Groundwater Survey," conducted by the Interstate Conference on Water Policy for the House Public Works and Transportation Subcommittee on Water Resources, the states reported a fairly uniform incidence of regulation in the areas of drinking water monitoring, landfills, waste water lagoons, pesticide distributor registration and reporting, septic tanks, disposal of hazardous wastes, land application of sewage sludge, investigation of potential contamination, and injection wells. This same survey reports that most of the responding forty-eight states feel a stronger federal role is needed in the areas of technical assistance, research and development, and funding assistance for existing groundwater programs.

API recommends that the historical role of state primacy in managing groundwater should continue without additional overlap from comprehensive legislation such as S. 20 or S. 1105 and that the most effective role of the federal government would be one of providing technical assistance to state and local governments. API has noted with interest the compromise version of HR 791 as it passed the House of Representatives in December of 1987. Provisions within this bill establish a new mechanism for coordinating the activities of federal groundwater agencies while also creating an information clearinghouse under the Department of the Interior. Importantly, this bill would allow the primary responsibility of groundwater protection, maintenance, and remediation to remain at the state level. Technical information, once made available to the states, would aid in guiding their own regulatory decisions regarding both the quality and quantity of their groundwater resources.

Similarly, the Wellhead Protection Program authorized under the Safe Drinking Water Act Amendments of 1986, is comprised of administrative and management concepts attractive to API. This protection scheme is an example of a program with a limited federal role while emphasizing the states' authority over groundwater quantity and quality issues. Although this protection program is currently implemented in only a few states, EPA is accommodating the unique needs and features of individual states in the protection of drinking water, not only because scientific factors and physical factors affecting drinking water vary from state to state, but because state laws and administrative practices do as well. The Wellhead Protection Program was enacted to both enhance state programs already underway and to begin such protection programs in other states by providing federal financial and technical assistance. API believes that this limited role of a federal agency responsible for drinking water, should be the model for the responsibilities of the federal agency managing groundwater issues.

Although API believes that comprehensive federal legislation such as S. 20 and S. 1105 is unnecessary, API would not oppose the following features found in these two bills:

(1) Retention of states' authority to establish their own groundwater management programs;

(2) Provisions that allow the flexibility to establish goals such as beneficial uses, as opposed to the federal government mandating unachievable goals such as nondegradation;

(3) The development of federal criteria for different beneficial uses of the groundwater coupled with state standard setting;

(4) EPA's responsibilities to provide technical assistance, establish general criteria, and the authority to withhold program funds from those states that fail to establish groundwater management programs.

However, API is concerned that provisions within both S. 20 and S. 1105 go too far, and specifically mandate a strict road map for states to follow in achieving a federally approved groundwater management program. This becomes an intrusive and unwelcome requirement. Necessary flexibility for states to devise sound resource management strategies is notedly lacking in this legislation. This flexibility should be substituted for the numerous specific requirements which we believe work to the nation's disadvantage in providing cost-effective approaches to groundwater management.

Specifically, API suggests incorporating the following observations to improve S. 20 and S. 1105 as effective groundwater protection measures:

- Eliminate stringent state timetables and the potential for very narrow prescriptive EPA guidance;
- Ensure that state groundwater standards are based on the beneficial uses of groundwater resources;
- Eliminate the health-based research provisions, as found in Section 104 of S. 1105.

State Timetables

Due to the complexities of groundwater resources, including varying hydrologic and geologic conditions, the state timetables established by S. 20 are too stringent. For example, the 30 month period for proposal of the ambient groundwater standards for the first 50 priority contaminant criteria set by EPA, could result in an inadequate technical assessment and regulatory promulgation on the part of the responsible state agency. The resultant state standards could be overly stringent or less than adequate in protecting the groundwater resources. In addition, many of the discrete groundwater systems which should be defined as "special" {Section 5 (b)(2)} could subsequently be ignored because of the tight time constraints for compliance. Certainly, haphazard management programs established by states simply to be the recipient of federal grant dollars, is not the intent of Congress in promoting the national goal of groundwater protection.

Therefore, API suggests that the "shall" language within every state provision of S. 20 (Section 5 through Section 10) be deleted and replaced with, "the state may include consideration of ...." In this way, problems associated with having to comply with very narrow prescriptive EPA guidance such as the setting of premature timetables are eliminated. Instead, states are granted the necessary flexibility to comply with our perception of the original intent of the legislation--the establishment of thorough, well researched groundwater protection programs.

State Standard Setting Should Reflect Groundwater Use

In considering the standard setting provisions of S. 20, Section 5(b) does allow states the opportunity to identify discrete and defined groundwater systems and establish standards for such systems based on the specific use of that groundwater.

However, API would suggest that even a more balanced approach to standard setting be incorporated into this legislation, one which considers the "beneficial uses" of groundwater and promotes a management process where choices are made based on full consideration of the available technical facts and societal values. To protect beneficial uses, groundwater quality programs should be structured to maintain groundwater quality that satisfies present and future drinking water needs and/or other beneficial uses and restores the quality of groundwater where feasible and appropriate.

The federal government has set "at the tap" standards for drinking water under the Safe Drinking Water Act. However, equating "at the tap" standards to all sources of groundwater is not fully considering the beneficial uses of that water and overlooks several important technical, economic, and value considerations. API contends that full protection of groundwater, consistent with its beneficial uses and the natural quality of the resource, involves integration of prevention, detection, and mitigation. Therefore, any groundwater management standard setting provisions should explicitly consider beneficial uses, technology, and costs in setting a preferred protection goal. Such a goal may be based upon one or more of the following criteria:

o The most stringent beneficial uses (e.g. drinking water) applied at the point-of-use, not in the ground at the point where contamination has occurred.

- o Site specific standards based on risk assessments which consider beneficial uses.

- o Application of cleanup technology to a "leveling off" point, recognizing the technical limitations of cleanup technology.

API finds these variations appropriate for the proper protection of groundwater and its beneficial uses. Therefore, we emphasize again, that in considering controls on potential contamination sources, adoption of a goal to protect beneficial uses provides for public health, technology, and cost considerations while allowing flexibility to satisfy actual public needs.

A final comment on standard setting requires some discussion on the topic of residual contamination (groundwater resources already impacted by activities of society) and the problems associated with resultant remediation actions. Should some level of contamination occur, remediation becomes a site specific problem with no easy technological solutions. In fact, technological constraints may prevent an area from ever being cleaned to pristine or even drinking water standards, a consideration not adequately addressed within the cleanup provisions of S.20.

Health-based Research Provisions Require Modifications

API has serious concerns about the health-based research requirements under Section 104 of S. 1105. Overall, it appears that the contaminant listing and research requirements for the manufacturer are already established and are being conducted under other federal environmental statutes. For example, the Superfund Amendments Reauthorization Act of 1986 (SARA) authorizes toxicological profiles of prioritized hazardous substances and health effects research under the health authorities of Section 104(i). Additionally, the Toxic Substances Control Act of 1976 (TSCA) mandates that manufacturers submit health and safety studies on chemical substances and mixtures distributed in commerce and requires testing of certain substances by rule. It appears that the S. 1105 health-based research requirements are repetitive, expensive, and time consuming test procedures better left to existing health-related statutes.

Finally, setting aside this redundancy with TSCA and SARA, one can also question the validity of the two year time requirement to carry out all the test provisions outlined in Section 104(b) of S. 1105. It is speculated that at least four to five years would be required to complete the specified testing procedures and to submit test results to the Administrator of EPA in final form. Therefore, one unfortunate conclusion which can be drawn from the stringent time constraints found in this bill, is that new prescriptive regulations on groundwater management programs will be completed, implemented, and imposed on states before the final test results on health impacts from contaminants are made available to regulators.

For example, S. 20 mandates that the Administrator establish criteria for 50 high priority contaminants within 18 months after the date of enactment of the Act. Secondly, Section 106 of S. 1105 requires that upon the date of enactment, a nationwide water quality assessment be carried out to identify contaminants associated with specific categories and subcategories of contaminant sources. The Administrator would then be required to prepare health advisories for each contaminant likely to be associated with such a category or subcategory.

Therefore, as designed, S. 20 calls for almost immediate regulation on specific groundwater contaminants. Yet, the evidence or health effects research substantiating the need for such regulation, as required under S. 1105, would not be readily available for at least two years after the fact. As a result, the scientific validity of the initial regulations will be questionable.

Conclusions

While S. 20 and S. 1105 do address the national interest in groundwater protection, API continues to believe that there is no need at this time for comprehensive federal groundwater legislation. There are existing federal statutes and effective state programs adequately protective of the groundwater resources of this nation. As noted, TSCA, CERCLA and SARA are examples of federal statutes already accomplishing much of what is attempted in both of these bills.

API does believe that states should continue to have primary authority for groundwater management. Additionally, the Institute supports a federal role in developing broadly applicable technical research information that would facilitate state protection of groundwater for its beneficial uses. An example of such federal development of technical information can be found in provisions of H.R. 791. In such a case, the necessary flexibility for program development is afforded to the states. Instead of prescriptive requirements on states such as those found in S. 20 and S. 1105, federal technical information and financial assistance should be made available to states to use at their own discretion in establishing an effective groundwater management and protection scheme. With an adequate data base from which states can draw final conclusions and develop a better groundwater protection approach, the possibility of repeating environmental management mistakes and oversights of the past should be alleviated.

Finally, API seeks to reemphasize the existence of numerous groundwater protection strategies and programs at the federal level and recommends focusing specific programs and finances on better coordination among these.

The American Petroleum Institute appreciates this opportunity to express these observations with respect to the groundwater issue as a whole, and in particular with respect to S. 20 and S. 1105. We are hopeful that the concerns and opinions raised can be of assistance to the Committee as it looks at the merits and problems associated with this comprehensive groundwater effort.

American Petroleum Institute
Responses to the Joint Subcommittee Questionnaire

1. **Is there a need for federal groundwater legislation or are there other federal statutes adequately addressing this need?**

API believes that there is no need at this time for federal groundwater legislation that would mandate prescriptive state groundwater programs and establish federal numerical groundwater standards. Furthermore, it is the belief of the Institute that the present federal and state groundwater management responsibilities though not without flaws, already substantially protect the nation's groundwater resources.

There currently exist some sixteen federal statutes having a direct impact on groundwater protection, and a number of additional statutes having an indirect impact. Some of these include the Safe Drinking Water Act (in particular its Underground Injection Control, Sole Source Aquifer, and Wellhead Protection Programs, and its National Primary Drinking Water Standards); the Resource Conservation and Recovery Act; the Toxic Substances Control Act; the Surface Mining Control and Reclamation Act; and the Superfund Amendments and Reauthorization Act; and the Clean Water Act. API believes that better coordination between and among these diverse existing federal programs and the regulations of the responsible federal agencies, would be a more effective objective to pursue at this time.

a. **Would a federal statute weaken other existing federal programs for groundwater?**

If the 100th Congress is determined to see the passage of a federal groundwater statute in 1988, then API would recommend that a statute which enables the existing authorities of all federal agencies with current groundwater research, assessment, and protection responsibilities to continue, while maintaining state primacy in groundwater management, would be appropriate.

b. **What efforts could be made to integrate and strengthen all these statutes?**

As part of EPA's Groundwater Protection Strategy guidelines have already been adopted calling for consistency among the various groundwater protection programs for which the Agency is responsible--to coordinate EPA groundwater programs within a common policy framework. The first step in this internal strengthening was the establishment of an Office of Groundwater in April of 1984. Coordination of EPA groundwater research priorities, classification strategies, state programs, and resource protection efforts have been developed by that office.

However, additional coordination and direction is needed in the face of the number of existing environmental statutes with potentially overlapping groundwater protection measures. This could be accomplished through the establishment of an interagency council or committee, as outlined in H.R. 791 and S. 1992. In both bills, such a committee, comprised of federal agency heads with groundwater responsibilities, would coordinate groundwater research efforts and facilitate interagency coordination with input from state and local representatives.

2. **Should the primary responsibility for groundwater management reside with state and local governments, or should there be an national goal set by the federal government? If there is to be a national goal, which agency should set it and what should it be?**

API recommends that the primary responsibility for groundwater management continue to reside with the states and that the most effective role of the federal government should be to provide technical and financial assistance to state and local governments. However, API would agree with a prevention-based national goal as recommended by the Environmental and Energy Study Conference in their October 23, 1986 Special Report. Such a goal, enacted by Congress in concert with appropriate federal regulatory agencies, should call for a new national commitment to groundwater protection while guiding federal, state, and local governments; the private sector; and science and technology communities.

Specifically, "a beneficial uses protection goal" is practical, achievable, and flexible enough to provide high levels of protection for drinking water supplies while allowing for other uses of a particular aquifer. A beneficial uses goal promotes a groundwater management process where choices are made based on full consideration of the available technical facts and societal values. To protect beneficial uses, groundwater quality programs should be structured to maintain groundwater quality that satisfies present and future drinking water needs and/or other beneficial uses and restores the quality of groundwater where feasible and appropriate.

a. **Should there be a strict federal nondegradation policy, a limited one, or should the states decide on nondegradation?**

API has already stated in its written testimony, that it finds it inappropriate for the federal government to require and mandate unrealistic and unachievable groundwater goals such as nondegradation. We continue to recommend the establishment of a national goal incorporating the concepts of the beneficial uses of our groundwater resources.

Additionally, due to the unique characteristics of groundwater resources, including its hydrogeologic properties, API believes that the states are the proper forum for developing groundwater protection strategies. Therefore, in the context of supporting a state primacy role in groundwater management, API would agree that states should have the authority to resolve all groundwater quality and quantity issues including that of nondegradation.

3. **Do you support the federal groundwater permits based on water quality criteria or federal source controls based upon potential for groundwater contamination?**

   - If so for what sources?

API strongly believes that states should continue to have authority over their individual groundwater management programs. Therefore, a federal permitting system or system of source controls would be inappropriate in this context. Further, although permits based on water quality criteria would not necessarily be the best way to proceed at the state level, API contends that states should make these decisions following their appropriate regulatory, legislative, and administrative channels. (e.g. public hearings or review.)

4. **How should the activities of Federal agencies be coordinated**

   -- by a committee designated by statute, a statutorily designated lead agency, or should this be the responsibility of the President?

   -- In answering please consider whether there should be one lead agency for research and another for regulation.

   -- If there were to be a federal entity to coordinate research among the agencies is there an existing suitable entity? (e.g. FCCSET--The Federal Coordinating Council on Science Engineering and Technology).

As noted in our response to question 1b, The Environmental Protection Agency already has the authority to better coordinate its groundwater protection programs. The Agency has taken steps to do so under the creation of a policy framework for guiding EPA programs and strengthening of internal groundwater organization, as outlined in the August 1984 Groundwater Protection Strategy. Additionally, in a 1985 Status Report on the EPA Protection Strategy, a specific goal was identified to create consistent EPA policy with consideration of the value of groundwater and its vulnerability in the administration of environmental programs and coordinating the development and implementation of groundwater policies with EPA Headquarters, Regional Offices, other federal agencies, and other interested constituencies.

Provisions within both H.R. 791 and S. 1992 reflect a similar goal of better coordinating groundwater policies and activities. H.R. 791 calls for the establishment of a Groundwater Research Committee to identify and coordinate major research data needs regarding groundwater and to facilitate interagency cooperation and coordination in consultation with state and local governments.

S. 1992 authorizes an Interagency Committee to coordinate existing federal activities relating to groundwater including input from state and local governments through the establishment of an Advisory Committee on Groundwater Protection.

5. For each of the following functional activities describe the role you see each of the various Federal agencies playing (including the funding and institutional arrangements, where appropriate), regardless of whether you approve of the function itself being carried out by the federal government.

a. Approving of state plans for assessment, monitoring, protection, or management.

If the federal government is giving financial support to states as they manage their individual groundwater protection programs, (a role deemed appropriate by API), then there must be some degree of accountability on the part of states. However, the decision on the federal level to give such financial assistance to an individual state should not be predicated on how closely that state plan follows prescriptive EPA guidance or other narrow, preconceived formulas for an "appropriate federally approved" groundwater management strategy. Instead, API would recommend that general groundwater management practices be considered by the state when developing a groundwater program. Examples of such management practices would include: groundwater resource assessment, groundwater management strategies, groundwater monitoring, and groundwater protection plans. Additionally, states should have the flexibility to derive their own specific guidance for the development of such management practices and not be required to incorporate every management practice offered for consideration.

b. The USGS would be the appropriate federal agency to provide technical assistance on matters of hydrogeology, resource assessment, resource management, mapping of aquifers and recharge areas, and data management. Additional information in these areas could prove to be helpful to states in formulating individual groundwater management programs.

c. With input from ATSDR, EPA would be the appropriate federal agency to provide technical assistance on matters of health effects, criteria setting, mitigation and remediation strategies. Again, while additional information in these areas would be helpful, API recommends that the states be given broad guidance, not narrow prescriptive requirements, from the federal government.

d. USGS, in cooperation with EPA, would be the appropriate federal agency to operate a groundwater information clearing house which would facilitate states' utilization of groundwater information to be used in the development of their individual groundwater management programs.

e. Similar to the answer given to question 5b, the USGS would be the appropriate federal agency for conducting hydrology, hydrogeology, and fate and transport research, developing monitoring network designs, and analyzing the vulnerability of groundwater to contamination.

f. EPA would be the appropriate federal agency for conducting research efforts relating to agriculture, domestic waste disposal, and industry groups. Specifically, EPA should work in cooperation with the USDA on agriculture research, and with the Department of Interior, Department of Energy, Department of Transportation, and the Department of Defense on specific industry group research.

g. EPA would be the appropriate federal agency for conducting research on health and ecological effects of contaminants. Specifically, several government agencies already have the authority to carry out health effects research, including the EPA under TSCA and CERCLA provisions, and the FDA under several statutes.

h. EPA and the USGS would be the appropriate federal agencies to conduct research and development programs on methods of groundwater remediation and treatment of contamination.

i. EPA would be the appropriate federal agency to issue health advisories.

j. The USGS would be the appropriate federal agency to conduct resource assessments as discussed in 5b above.

In the foregoing answers to questions 5a-5i, API has indicated what we believe to be the appropriate federal agency (agencies) to carry out specific types of research activities. However, API emphasizes that any federal legislation that addresses research should not be crafted in regulatory detail, as in S. 1105, but should be written as broad topographical guidance with the detailed implementation left to the designated responsible federal agency or agencies as in H.R. 791.

6. How should the needed university research and educational programs related to groundwater be strengthened (e.g. institutes, fellowships, competitive research grant programs) and how should these be administered?

- The Water Resources Research Act (P.L. 98-242) is authorized through 1989. This Act funds 54 research institutions on a 40/60 federal-state matching basis. How can this program be incorporated into the new groundwater bills?

Without commenting on the need or appropriateness for additional university research and educational programs relating to groundwater, it is the belief of API that additional activities in these areas could be better coordinated through an interagency committee such as that described in H.R. 791 and S. 1992 and previously discussed in the answer to question 1b above.

7. **Comment on the USGS National Water Quality Assessment Program and how that relates to any of the assessments and studies in S. 20, S. 1105 and H.R. 791.**

API would agree with the comments made by James W. Ziglar, Assistant Secretary for Water and Sciences, U.S. Department of Interior, in his February 23, 1988 testimony given before this joint Subcommittee, with regard to the USGS National Water Quality Assessment Program. The Program is essential to providing a baseline for evaluating trends in water quality and assessing the nations total groundwater resources. API contends that while this is a worthwhile program which should be continued within the DOI/USGS, it should not be diminished or duplicated through provisions of S. 20, S. 1105, or H.R. 791.

API would also warn against the establishment of unrealistic timetables for such groundwater assessment responsibilities and studies. Unrealistic time constraints could lead to poor science and result in poorly designed and implemented groundwater management programs.

8. **Comment on EPA's classification scheme and how it relates to each of the three bills.**

While EPA's groundwater classification scheme is not necessarily the optimum, it nonetheless is a valuable first step effort in that it recognizes that all groundwater resources are not equal (e.g. not all groundwater is drinking water.) EPA's scheme is based upon a concept of differential protection whereby different classes of groundwater are protected to differing degrees based upon their immediate and intended quality and use. API would agree with such a differential or distinction strategy but emphasizes that states are the proper management forum to determine exactly how their groundwater resources would fit into such a strategy and thus be protected through differentiation.

9. **To what extent should the federal government concern itself with groundwater depletion? Research only? Regulation?**

Groundwater depletion is a quantity issue which historically has been controlled and managed at the state level. For example, western state representatives have tightly guarded quantity issues based upon the long development of western water resource law. Again, API underscores that the management of groundwater quantity and quality issues should be left to the authority of state government and that the proper role for the federal government should be one of offering technical and financial assistance to bond an appropriate federal/state relationship.

10. To what degree are states using land use controls to prevent groundwater contamination?

State and local governments have historically been using zoning laws and regulations to restrict and prohibit activities for specified areas. While to the best of our knowledge groundwater contamination prevention was not the principle criterion in zoning decisions of the past, it is becoming a consideration in many present day zoning determinations.

While API supports the concept that the state and local levels of government are the appropriate administrative levels for determining land use laws and regulations, API also suggests that these laws should promote flexibility such as minimum performance technology, rather than complete prohibition of activities or highly specific rules for equipment design and operating practices.

11. Given limited fiscal resources what are the priority programs and activities to fund in these bills?

Although API believes that federal comprehensive groundwater legislation is not appropriate at this time, much thought has been given to what should be contained in any federal initiative which is being seriously considered by this joint Subcommittee. API believes the following components should be incorporated in such federal legislation:

- Primary responsibility for management of groundwater should continue to reside with the states.
- The role of the federal government should be limited to providing technical assistance, technical expertise, and data acquisition and analysis for use by states.
- The federal authority should be limited to assisting states in development of their groundwater management programs, rather than having final program approval.
- The federal government should develop criteria that the states can use to develop groundwater standards; for aquifers designated as drinking water sources, the appropriate standards are the Maximum Contaminant Levels (MCLs) of the Safe Drinking Water Act, applied at the wellhead.
- The federal legislation should not require the direct application of Drinking Water Standards under the Safe Drinking Water Act to all groundwater.

- The federal government should strive to better coordinate existing federal programs which impact groundwater. (CWA, SDWA, SARA/CERCLA, RCRA, etc....).

12. Please point out an exemplary state groundwater program or add any other comments not covered in your statement.

Each state has different needs with regards to the unique quality, quantity, and physical and chemical characteristics of their groundwater resources. Therefore, API would strongly support the position that individual states should have individualized groundwater management programs and that extremely prescriptive guidance from the federal government hinders, instead of aiding the overall effort towards achieving a national goal of groundwater protection. A single universal federal groundwater program intended to be applicable to all states is simply not appropriate.

ASSOCIATION OF STATE DRINKING WATER ADMINISTRATORS
1911 NORTH FORT MYER DRIVE ARLINGTON, VIRGINIA 22209 (703) 524-2428

Written Testimony of

THE ASSOCIATION OF STATE DRINKING WATER ADMINISTRATORS

Regarding
Groundwater Protection

for the

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
Subcommittee on Water Resources, Transportation, and Infrastructure
and
Subcommittee on Hazardous Wastes and Toxic Substances

Joint Hearing
March 24, 1988

Joint Hearing
# of the
Subcommittee on Water Resources, Transportation, and Infrastructure and the Subcommittee on Hazardous Wastes and Toxic Substances

Regarding Groundwater Protection

March 24, 1988

The Association of State Drinking Water Administrators (ASDWA) submits the following written testimony to convey the Association's perspective on groundwater protection legislation. ASDWA requests that its comments be included in the record of the joint hearing held today before the Subcommittee on Water Resources, Transportation, and Infrastructure and the Subcommittee on Hazardous Wastes and Toxic Substances.

As you may know, ASDWA is the professional association that represents the interests of state drinking water programs at the national level. Members include the drinking water program administrators in the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. Major activities of the Association include 1) participating in the Environmental Protection Agency's (EPA) 1986 Safe Drinking Water Act (SDWA) implementation workgroups; 2) conducting research regarding state SDWA implementation costs, current resource levels of state programs, and historic funding levels of the national SDWA program; 3) providing technical training opportunities to the states on issues of concern; and 4) assisting the EPA and other organizations in educating the public regarding the need to protect the safety of drinking water supplies (i.e., encouraging consumer willingness to pay for safe drinking water).

As an organization composed of state water officials, ASDWA believes it has a role to play in the groundwater dialogue currently taking place at the national level. The primary responsibility of state drinking water administrators is the protection of human health through the regulation of drinking water supplies. Since groundwater is a major source of drinking water, ASDWA members are actively involved in the monitoring of groundwater resources in order to prevent contamination. Due to such activities, ASDWA members have available the most current information with respect to groundwater contaminants, especially for such substances as volatile organic chemicals. State drinking water administrators are required through the programs they manage to define "how clean is clean" for water supplies within their respective states. These drinking water standards are likely to be the most stringent water standards in the states and must be taken into account in the development of groundwater protection activities. For this reason, ASDWA members are actively involved within their respective states in the development of comprehensive groundwater programs. The experiences of ASDWA members in implementing the SDWA as well as participating in the development of state groundwater programs places ASDWA in a position to provide valuable information to the Congress on proposed groundwater legislation.

The following text outlines ASDWA's position with respect to federal groundwater legislation. The underlying premise of the Association's comments is that the states should continue to have primary responsibility for the development, implementation, and management of groundwater protection programs. ASDWA does not believe, however, that a complete answer can be provided to the question of, "Is there a need for federal groundwater legislation?" until the problem of groundwater contamination is fully defined and until the effectiveness of current preventive and remedial activities is evaluated.

Need for Federal Groundwater Legislation

The Association believes that federal groundwater legislation is necessary for the purpose of integrating existing protection activities and to implement additional means of protection where none exists. ASDWA does not believe that the nation can fully protect the groundwater resource in an efficient manner until coordination of existing programs is complete. While the Executive Agencies involved in groundwater protection efforts, such as the EPA and the US Geological Survey (USGS), have made progress in consolidating and summarizing their respective activities, no single coordinating body exists to manage the overall national effort. The result is that the states, local governments, and the public do not adequately understand the extent of federal activities with respect to groundwater protection.

While recommending federal groundwater legislation, ASDWA is opposed to a highly prescriptive approach. The Association envisions legislation that defines the full spectrum of groundwater contamination problems and then outlines alternatives for prevention and protection. The states, in turn, should select the appropriate alternatives for protecting groundwater resources within their respective boundaries. The ultimate goal of groundwater legislation should be the protection of human health and the environment. The means to attain this goal would be to emphasize the development of preventive activities at the state level.

In defining the problem of groundwater contamination, current federal preventive or remedial activities must first be identified. Where such activities do not exist to address an element of the groundwater problem, steps for action must be determined. Both existing activities and future actions would most clearly be understood if united through a single law. ASDWA is not advocating that existing provisions for the protection of groundwater be discarded; the Association does not see the need to duplicate existing efforts. However, ASDWA does believe that the nation cannot adequately prevent groundwater contamination if it approaches the problem in a piecemeal fashion. The current situation in which at least 16 federal statutes contain groundwater provisions is not an efficient means of protecting the resource.

Further Basis for Legislation and Respective Responsibilities

ASDWA would support national groundwater legislation that encourages the development of comprehensive programs (based upon a preventive philosophy) at the state level. The Association believes that such legislation must be developed in consultation with various federal and state agencies involved in groundwater protection activities. In addition to protecting human health and the environment, the enactment of federal groundwater legislation should serve the purpose of making a long-term commitment to the preservation of the resource. Such a commitment must be made cooperatively by all parties involved in protection activities. The realization of an effective national groundwater program will be dependent upon the quality of the relationship between the federal government and the states.

The Association does not support a strict federal nondegradation policy for groundwater. Such an approach would be unrealistic as well as costly. The concept that should be embodied in federal legislation is that groundwater should be protected for its highest possible use and that the states should determine such utility. Such determinations may involve either uniform or differential classification schemes in the states. Federal legislation must provide flexibility to the states to develop and implement groundwater protection programs to meet unique circumstances. Existing zoning and land use programs will need to be evaluated by the states to determine if the groundwater resource is adequately being protected. In many instances, zoning and land use controls do not extend to towns and urban peripheries. To overcome existing barriers to protecting groundwater resources within a given state's boundaries will require a thorough understanding of the state's social, economic, and political environment. Innovative strategies will need to be developed by the entities closest to the problem (i.e., the states and local governments). The bottom line is that the federal government cannot play a useful role in making statewide groundwater determinations. There must remain an appreciation for the unique situations that exist within each state. An attempt to alleviate state groundwater problems by "force fitting" states into specific groundwater action plans would be an exercise in futility.

State programs for groundwater protection would include the means for conducting resource assessments, developing standards and a classification system (with state discretion for uniform classifications), evaluating and revising, where necessary, land use control programs, enacting or strengthening point or non-point source controls, and establishing monitoring programs. For consistency, state standards should be at least as stringent as existing federal water quality standards. The maximum contaminant level goals (MCLGs) or maximum contaminant levels (MCLs) established under the 1986 SDWA should serve as minimum standards for the states for aquifers deemed current or future sources of drinking water. Some states may opt to use the MCLGs as the basis for preventing contamination while MCLs serve as the actual clean-up levels once an aquifer is contaminated. Some states, however, may wish to employ a preventive standard that is based upon a percentage of an MCL as opposed to the MCLG. The federal government could support these activities and contribute to the decision-making process at the state level by conducting research, providing technical assistance, developing and providing health-based criteria, and providing financial incentives and resources.

Coordination of Federal Activities

ASDWA believes that a federal coordinating body whose members are officials from federal and state agencies involved in groundwater activities is required to manage the overall protection effort. This body should not be limited to the coordination of research activities, but include the coordination of regulatory activities as well. Federal legislation should seek to coordinate existing and future groundwater protection activities through a single entity. It should be the responsibility of the coordinating body to determine which federal agency can most appropriately accomplish the tasks at hand. Such a determination would be based upon an evaluation of each agency's historical participation in groundwater protection. If a sound/successful structure exists within a federal agency to prevent and/or mitigate groundwater contamination problems, ASDWA does not see a need to disassemble the organization. However, if there is duplication of activities or an existing program is not sound, a decision must be made as to which federal entity should be responsible. ASDWA believes a coordinating body that includes federal, state, and local officials as well as researchers actively involved in groundwater protection would serve as the most efficient and effective vehicle for making such determinations.

In summary, ASDWA supports federal involvement in the area of groundwater protection for the purpose of defining the extent of the problem and for elucidating alternatives for action. Moreover, ASDWA supports federal involvement for the purposes of coordination and consistency in the overall national effort. The

Association also endorses continued federal involvement in the areas of research, technical assistance, the development of health-based criteria, and the provision of financial incentives and resources. In a time when federal and state governments must be prudent in the expenditure of resources, we must be confident that we have evaluated the complete nature of the problem, and are aware of current resources that can be utilized to address the problem before implementing additional activities. The consciousness of the nation has been raised to understand that more must be accomplished for less. However, to be successful in such an endeavor means efficient utilization of resources as well as rational short- and long-term planning.

ASDWA appreciates the Committee's consideration of its comments and hopes that they will prove useful as well as informative. Once again, the Association wishes to participate in the groundwater dialogue and would appreciate the opportunity to testify at forthcoming hearings on the issue. We have enclosed the Association's previously written comments on Senate Bill 20 as further elaboration of our views.

Association of State Drinking Water Administrators

1911 N. Fort Myer Drive, Arlington, VA 22209 (703) 524-2428

June 30, 1987

The Honorable Daniel P. Moynihan
Chairman, Subcommittee on Water Resources,
Transportation, and Infrastructure
Committee on Environment and Public Works
United States Senate
SD 458 Dirksen Senate Office Building
Washington, DC 20510

Dear Senator Moynihan:

On behalf of the Association of State Drinking Water Administrators (ASDWA), I am writing to provide comments on Senate Bill 20. We are pleased that the Congress is investigating the issue of groundwater protection and would like to participate in the dialogue. As you may know, ASDWA is the professional organization which represents state drinking water regulatory agencies at the national level. The Association's primary mission is the protection of public health through effective and efficient management of state water supply programs and implementation of the Safe Drinking Water Act (SDWA) Amendments. To this end, the Association has been providing vital communication, coordination, and information transfer services between state programs and the EPA, Congress, and other national organizations since the Association's inception in 1984. ASDWA's current formal membership stands at 34 states; it is expected that at least 38 states will be dues-paying members of the Association by the end of the year. To date, 46 of 57 states and territories have indicated their support for the Association and have participated actively in various ASDWA activities.

The relationship between drinking water quality and other environmental protection programs has become increasingly apparent in recent years. Although hazardous waste and toxic substances have received greater media attention than drinking water, it is recognized that a primary goal of remediation at waste disposal sites and of limitations on pollutant discharges is to avert or mitigate contamination of drinking water sources-- both ground and surface sources. The establishment, implementation, and enforcement of drinking water standards will facilitate the development of a definition of "how clean is clean" for use in specifying remedial standards and effluent guidelines. State drinking water primacy agencies will have the central role in ensuring that the standards and requirements mandated under the SDWA Amendments become fully entrenched as the law of the land. Since groundwater is a major source of drinking water for over half the nation's population, the Association firmly believes that groundwater protection legislation should protect the viability of aquifers, as well as be consistent with the intent of the SDWA.

In general, the Association is favorably impressed with the direction of Senate Bill 20. There are a number of states that have adopted legislation which is similar to and would be consistent with this bill. We are especially pleased to see an appreciation for state flexibility in the bill with regard to protecting groundwater resources. However, there are several areas where, by modification, the proposed legislation could be substantially improved. The Association's specific comments are as follows:

1. Any groundwater bill should take into consideration existing groundwater requirements in other federal laws. Strong consideration should be given to repealing other laws and combining all requirements into a single bill to assure consistency and coordination. If this suggestion is not acceptable, we then strongly encourage that the Groundwater Management Strategy included under Section 7 of the bill be cross-referenced and made consistent with the Wellhead Protection Program incorporated within the Safe Drinking Water Act Amendments of 1986.

2. In Section 3, we suggest the term "groundwater" be defined.

3. Since there appears to be an attempt to tie groundwater standards to primary drinking water standards in the legislation, it would seem reasonable to integrate the establishment of criteria under Section 4 to the establishment of maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLGs) under the Safe Drinking Water Act.

4. Section 5(a)(3) infers that groundwater standards will only be established for contaminants of health concern (reference is to primary drinking water standards). We believe standards should also be required for aesthetic contaminants (e.g., iron).

5. A major concern of the Association is the use of MCLs as standards against which polluting activities will be measured. The concern is that if an exceedance of a standard is necessary before corrective action can be required, the groundwater will be unfit for consumption.

We suggest the bill require the state to establish a program to institute corrective measures when a percentage of the standard is exceeded. There are several states which have implemented this concept and further detail can be provided if necessary.

6. Under Section 5(c)(2), states would not be required to establish standards for a contaminant if the contaminant is not found in the state. As long as criteria documents are available from the EPA Administrator, the Association does not see any reason for a state to not establish a standard even if the contaminant is not found within the state.

7. Section 5(e)(1) and (2) would require states to establish standards at different times. We suggest that consideration be given to consolidating these timeframes and integrating them more closely with the establishment of MCLs and MCLGs under the Safe Drinking Water Act.

8. Section 5(e)(3) and (4) and Section 9(b)(3) provide specifications and timing constraints for states to adopt standards and propose groundwater protection programs to the EPA Administrator. We urge that the specificity for adopting standards and proposing protection programs be eliminated due to the varying nature of administrative rule procedures within the states. Public participation in the rulemaking process, however, should be maintained.

9. We question the value of the groundwater assessment required by Section 6. It is our opinion that such an assessment will not provide the type of information which is useful to program management and control of pollution sources. Methods used to assess the status of groundwater resources could easily be manipulated to depict either significant or minimal pollution levels. In the event the requirement is retained, we believe the Section should be rewritten to place responsibility for overall management and provision of grants with the EPA rather than the US Geological Survey (USGS). The USGS, however, should be included as a technical resource to the EPA.

10. Since most states currently have satisfactory information management systems and have been involved with groundwater monitoring for some period of time, we question the need for the requirements found in Sections 8(b)(1) and (2).

11. The requirement for a report under Section 8(c) is similar to and consistent with the report required by Section 305(b) of the Clean Water Act. We suggest that states be given the option of using the 305(b) report to provide the required information if they so choose.

12. Sections 9(b)(1) and (2) would require states to propose groundwater protection programs addressing sources of contamination within different timeframes. Similar to our comment under point seven above, we suggest consolidation of these requirements.

13. To control the discharge of contaminants to groundwater, several states have developed permitting programs similar to and consistent with the permitting program for discharges to surface waters under the National Pollutant Discharge Elimination System (NPDES). We suggest consideration be given to amending the NPDES program to require permitting for all waste discharges whether to surface or ground waters.

14. Concerning grants for planning and program management under Section 10(b), we strongly object to the 50 percent proposed grant share agreement. With state fiscal constraints and other program demands, we believe the federal share must be at least at the 75 percent level. In addition, Congress and the Administration have a history of authorizing substantially more money than is ultimately appropriated. If the program envisioned by this bill is to be successful, full appropriations will be essential.

In summary, ASDWA is encouraged by the direction of Senate Bill 20. The proposed legislation respects state primacy in the area of groundwater protection and provides latitude in the development of individual state programs. We appreciate the Subcommittee's consideration of our comments and hope they are useful as well as informative. Please feel free to contact us if we can provide additional information.

Sincerely,

Robert Krill

Robert Krill
Chairman, ASDWA Groundwater
Committee and Director,
Wisconsin's Bureau of Water Supply

ASSOCIATION OF STATE DRINKING WATER ADMINISTRATORS
1911 NORTH FORT MYER DRIVE ARLINGTON, VIRGINIA 22209 (703) 524-2428

March 24, 1988

Senator Quentin N. Burdick
Chairman, Senate Committee on
Environment and Public Works
SD-458 Dirksen Senate Office Building
Washington, DC 20510

Dear Senator Burdick:

I am writing on behalf of the members of the Association of State Drinking Water Administrators (ASDWA) to convey our perspective on groundwater protection legislation. The Association would like the comments contained herein to be included in the record of the joint hearing to be held on March 24 by the Subcommittee on Water Resources, Transportation, and Infrastructure and the Subcommittee on Hazardous Wastes and Toxic Substances. Moreover, the Association would like to request the opportunity to testify before the Committee if future hearings on groundwater are conducted.

As you may know, ASDWA is the professional association that represents the interests of state drinking water programs at the national level. Members include the drinking water program administrators in the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. Major activities of the Association include 1) participating in the Environmental Protection Agency's (EPA) 1986 Safe Drinking Water Act (SDWA) implementation workgroups; 2) conducting research regarding state SDWA implementation costs, current resource levels of state programs, and historic funding levels of the national SDWA program; 3) providing technical training opportunities to the states on issues of concern; and 4) assisting the EPA and other organizations in educating the public regarding the need to protect the safety of drinking water supplies (i.e., encouraging consumer willingness to pay for safe drinking water).

As an organization composed of state water officials, ASDWA believes it has a role to play in the groundwater dialogue currently taking place at the national level. The primary responsibility of state drinking water administrators is the protection of human health through the regulation of drinking water supplies. Since groundwater is a major source of drinking water, ASDWA members are actively involved in the monitoring of groundwater resources in order to prevent contamination. Due to such activities, ASDWA members have available the most current information with respect to groundwater contaminants, especially for such substances as volatile organic chemicals. State drinking water administrators are required through the programs they manage to define "how clean is clean" for water supplies within their respective states. These drinking water standards are likely to be the most stringent water standards in the states and must be taken into account in the development of groundwater protection activities. For this reason, ASDWA members are actively involved within their respective states in the development of comprehensive groundwater programs. The experiences of ASDWA members in implementing the SDWA as well as participating in the development of state groundwater programs places ASDWA in a position to provide valuable information to the Congress on proposed groundwater legislation.

The following text outlines ASDWA's position with respect to federal groundwater legislation. The underlying premise of the Association's comments is that the states should continue to have primary responsibility for the development, implementation, and management of groundwater protection programs. ASDWA does not believe, however, that a complete answer can be provided to the question of, "Is there a need for federal groundwater legislation?" until the problem of groundwater contamination is fully defined and until the effectiveness of current preventive and remedial activities is evaluated.

Need for Federal Groundwater Legislation

The Association believes that federal groundwater legislation is necessary for the purpose of integrating existing protection activities and to implement additional means of protection where none exists. ASDWA does not believe that the nation can fully protect the groundwater resource in an efficient manner until coordination of existing programs is complete. While the Executive Agencies involved in groundwater protection efforts, such as the EPA and the US Geological Survey (USGS), have made progress in consolidating and summarizing their respective activities, no single coordinating body exists to manage the overall national effort. The result is that the states, local governments, and the public do not adequately understand the extent of federal activities with respect to groundwater protection.

While recommending federal groundwater legislation, ASDWA is opposed to a highly prescriptive approach. The Association envisions legislation that defines the full spectrum of groundwater contamination problems and then outlines alternatives for prevention and protection. The states, in turn, should select the appropriate alternatives for protecting groundwater resources within their respective boundaries. The ultimate goal of groundwater legislation should be the protection of human health and the environment. The means to attain this goal would be to emphasize the development of preventive activities at the state level.

In defining the problem of groundwater contamination, current federal preventive or remedial activities must first be identified. Where such activities do not exist to address an element of the groundwater problem, steps for action must be determined. Both existing activities and future actions would most clearly be understood if united through a single law. ASDWA is not advocating that existing provisions for the protection of groundwater be discarded; the Association does not see the need to duplicate existing efforts. However, ASDWA does believe that the nation cannot adequately prevent groundwater contamination if it approaches the problem in a piecemeal fashion. The current situation in which at least 16 federal statutes contain groundwater provisions is not an efficient means of protecting the resource.

Further Basis for Legislation and Respective Responsibilities

ASDWA would support national groundwater legislation that encourages the development of comprehensive programs (based upon a preventive philosophy) at the state level. The Association believes that such legislation must be developed in consultation with various federal and state agencies involved in groundwater protection activities. In addition to protecting human health and the environment, the enactment of federal groundwater legislation should serve the purpose of making a long-term commitment to the preservation of the resource. Such a commitment must be made cooperatively by all parties involved in protection activities. The realization of an effective national groundwater program will be dependent upon the quality of the relationship between the federal government and the states.

The Association does not support a strict federal nondegradation policy for groundwater. Such an approach would be unrealistic as well as costly. The concept that should be embodied in federal legislation is that groundwater should be protected for its highest possible use and that the states should determine such utility. Such determinations may involve either uniform or differential classification schemes in the states. Federal legislation must provide flexibility to the states to develop and implement groundwater protection programs to meet unique circumstances. Existing zoning and land use programs will need to be evaluated by the states to determine if the groundwater resource is adequately being protected. In many instances, zoning and land use controls do not extend to towns and urban peripheries. To overcome existing barriers to protecting groundwater resources within a given state's boundaries will require a thorough understanding of the state's social, economic, and political environment. Innovative strategies will need to be developed by the entities closest to the problem (i.e., the states and local governments). The bottom line is that the federal government cannot play a useful role in making statewide groundwater determinations. There must remain an appreciation for the unique situations that exist within each state. An attempt to alleviate state groundwater problems by "force fitting" states into specific groundwater action plans would be an exercise in futility.

State programs for groundwater protection would include the means for conducting resource assessments, developing standards and a classification system (with state discretion for uniform classifications), evaluating and revising, where necessary, land use control programs, enacting or strengthening point or nonpoint source controls, and establishing monitoring programs. For consistency, state standards should be at least as stringent as existing federal water quality standards. The maximum contaminant level goals (MCLGs) or maximum contaminant levels (MCLs) established under the 1986 SDWA should serve as minimum standards for the states for aquifers deemed current or future sources of drinking water. Some states may opt to use the MCLGs as the basis for preventing contamination while MCLs serve as the actual clean-up levels once an aquifer is contaminated. Some states, however, may wish to employ a preventive standard that is based upon a percentage of an MCL as opposed to the MCLG. The federal government could support these activities and contribute to the decision-making process at the state level by conducting research, providing technical assistance, developing and providing health-based criteria, and providing financial incentives and resources.

Coordination of Existing Activities

ASDWA believes that a federal coordinating body whose members are officials from federal and state agencies involved in groundwater activities is required to manage the overall protection effort. This body should not be limited to the coordination of research activities, but include the coordination of regulatory activities as well. Federal legislation should seek to coordinate existing and future groundwater protection activities through a single entity. It should be the responsibility of the coordinating body to determine which federal agency can most appropriately accomplish the tasks at hand. Such a determination would be based upon an evaluation of each agency's historical participation in groundwater protection. If a sound/successful structure exists within a federal agency to prevent and/or mitigate groundwater contamination problems, ASDWA does not see a need to disassemble the organization. However, if there is duplication of activities or an existing program is not sound, a decision must be made as to which federal entity should be responsible. ASDWA believes a coordinating body that includes federal, state, and local officials as well as researchers actively involved in groundwater protection would serve as the most efficient and effective vehicle for making such determinations.

In summary, ASDWA supports federal involvement in the area of groundwater protection for the purpose of defining the extent of the problem and for elucidating alternatives for action. Moreover, ASDWA supports federal involvement for the purposes of coordination and consistency in the overall national effort. The Association also endorses continued federal involvement in the areas of research, technical assistance, the development of health-based criteria, and the provision of financial incentives and resources. In a time when federal and state governments must be prudent in the expenditure of resources, we must be confident that we have evaluated the complete nature of the problem, and are aware of current resources that can be utilized to address the problem before implementing additional activities. The consciousness of the nation has been raised to understand that more must be accomplished for less. However, to be successful in such an endeavor means efficient utilization of resources as well as rational short- and long-term planning.

ASDWA appreciates the Committee's consideration of its comments and hopes that they will prove useful as well as informative. Once again, the Association wishes to participate in the groundwater dialogue and would appreciate the opportunity to testify at forthcoming hearings on the issue. We have enclosed the Association's previously written comments on Senate Bill 20 as further elaboration of our views.

Sincerely,

Robert M. Krill

Robert M. Krill
Chairman, ASDWA Groundwater
Committee and Director,
Wisconsin Bureau of Water Supply

Enclosures

cc: ASDWA Membership

ASWMO
Association of State and Territorial Solid Waste Management Officials
444 North Capitol Street, N.W. •Washington, D.C. 20001 •202-624-5828

March 22, 1988

Ms. Nan Stockholm
Associate Majority Counsel
Committee on Environment
and Public Works
United States Senate
508 Hart Building
Washington, D.C. 20510

Re: ASTSWMO Groundwater Issues Task Force Comments on
Groundwater Legislation

Dear Ms. Stockholm:

Groundwater is a limited resource and is vulnerable to depletion and contamination from a variety of human activities. Aquifers may become contaminated from either man-made or natural sources. The susceptibility of aquifers to contamination from man-made sources may be influenced by factors such as population density, industrial development, agricultural development, and the hydrogeological setting. Susceptibility of aquifers to natural sources of contamination may be affected by groundwater withdrawal practices, and the hydrogeological setting.

Federal ground water legislation may be needed to promote the prevention of ground water contamination as a national goal to further protect the public health and welfare and to protect the environment. However, many existing federal statutes affect ground water protection including:

CERCLA/SARA - "Superfund" cleanup of abandoned waste sites.

RCRA/HSWA - Regulates handling and disposal of hazardous and solid wastes

SDWA - Regulates underground injection of fluids, protection of sole source aquifers and public drinking water supplies.

SMCRA - Regulates surface and reclamation mining activities.

CWA - Clean Water Act, coordinates ground water programs, point and nonpoint source discharges.

FIFRA - Registration and labeling of pesticides.

Any new legislation could be based upon these existing statutes, following an evaluation to eliminate overlap, regulatory conflicts and duplication of effort and/or resources. Such legislation should strive for consistent implementation among the statutes or at least a consolidated framework of requirements while remaining flexible enough to meet the needs of the public on a local level. The Task Force feels that the following elements are a necessary part of any successful ground water legislation:

- Recognition that many different state protection programs are in place utilizing a variety of methods which reflect the diversity of ground water quality, quantity and usage throughout the nation. Further information is available through specific ground water protection strategies developed by individual states.

- Although ground water is important as a national resource, it is a local resource by the nature of its accessibility for development and its susceptibility to contamination. State and local governments are therefore best situated to manage the quality and quantity of ground water consistent with the protection of the public health and welfare, protection of potential uses, operation of existing businesses and providing a dependable supply for future economic development.

- Thorough knowledge of ground water resources is vital to ground water protection. Identification and mapping is needed for all types of aquifers to determine ground water availability, quality, characteristics and recharge zones. This characterization of ground water resources must precede any classification of ground water. Ground water classification, as currently discussed, is a method for categorizing and comparing sources of ground water to establish varying protection priorities for sources of ground water. Currently much of the identification and mapping of aquifer systems nationally is performed or aided by the U. S. Geological Survey. National summaries, however, are limited in usefulness. There is a greater need for local characterization studies in order to help develop protection standards and remediation goals.

- The Environmental Protection Agency has proposed a ground water classification system. However, the states must be free to adopt the EPA system or develop their own more or less stringent classification system in order to establish state or local priorities and protection standards for their ground water resources. Once a state has adopted a classification system, the adopted system must be the one used by all federal and state agencies in carrying out the appropriate roles.

- States should develop and enforce ground water protection standards and/or triggers for remedial action. The states should have the flexibility to choose between numerical standards, non-degradation standards or a process for "risk-based" numbers given site specific factors; or even to use a combination of these approaches. States must be able to use such approaches as they feel appropriate to any ground water or ground water systems within the state including any "special ground water systems" designated by the state.

- The development of sound ground water standards requires the ready availability of health and aesthetic based data. EPA has begun work which could serve this purpose under the Safe Drinking Water Act and should continue with the prompt development of MCLG's and MCLs as sources of information or available references to aid states in the development of their standards. Of most value to the states would be the health based criteria "raw" numbers, those without available technology factored into the criteria.

- Ground water legislation should recognize the need for changing ground water standards and perhaps changing classification systems in response to ever-changing technologies. There needs to be a mechanism for continued dialog on remediation goals. States must retain maximum flexibility to adopt more appropriate standards as new information is developed.

- Finally existing information systems (example-STORET used by both EPA and USGS) should be utilized wherever possible in compiling and reporting ground water information.

Thank you for your consideration of these comments. If you have any questions please contact me at 512/463-7760 or Tom Kennedy in the ASTSWMO office at 624-5351.

Sincerely,

Bryan W. Dixon
President, ASTSWMO

cc: Mr. Lee Thomas, Administrator, U. S. Environmental Protection Agency
Mr. Bill Child, Vice-President, ASTSWMO
Mr. Tom Kennedy, Executive Director, ASTSWMO
Groundwater Issues Task Force Members

WRITTEN STATEMENT OF

THE EDISON ELECTRIC INSTITUTE

ON

S. 1105, S. 20 AND H.R. 791

BEFORE THE

SUBCOMMITTEE ON WATER RESOURCES, TRANSPORTATION AND INFRASTRUCTURE

AND THE

SUBCOMMITTEE ON HAZARDOUS WASTES AND TOXIC SUBSTANCES

OF THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

April 21, 1988

EDISON ELECTRIC INSTITUTE WRITTEN STATEMENT ON S. 1105, S. 20, AND H.R. 791

The Edison Electric Institute (EEI) is the association of the nation's investor-owned electric utilities. Our member companies serve 97 percent of all customers served by the investor-owned segment of the industry and 73 percent of all electric utility customers in the country. In addition, our members generate 76 percent of all electricity in the nation.

In generating and distributing electricity, our members rely on groundwater for a variety of purposes, including cooling water, process water, and drinking water. More than 125 U.S. power plants with a combined generating capacity of approximately 35 million kilowatts use groundwater for all or part of their condenser cooling needs. Thus, electric utility companies, as groundwater users, are concerned with the quality and quantity of the resource.

In addition, electric utility companies are subject to a variety of existing state and federal groundwater-related regulations, and they often are interested in the potential impacts of new legislative and regulatory proposals in this area. As a result, our companies are particularly interested in the potential impacts of a number of bills under Congressional consideration, including S. 1105, S. 20, and H.R. 791.

For these reasons, EEI has actively studied and addressed

groundwater issues for a number of years. The Institute has developed industry policy positions with respect to groundwater. In addition, it has studied the existing federal and state legislative and regulatory framework for groundwater protection and management. Furthermore, it has addressed technical groundwater issues, such as assessing the natural quality of groundwater in the United States.

As a result, EEI has both an interest in any groundwater legislation being considered by Congress and an informed view to offer. In this statement, we provide, in two separate sections: (1) our general policy views on issues raised by the three bills on which we are commenting, including responses to the policy questions posed by Committee staff in regard to the three bills; and (2) specific comments on the bills.

GENERAL DISCUSSION

Introduction

Our nation's groundwater resources should be managed and protected for the maximum benefit of society. The management process should be flexible as well as open and responsive to the many users of the resource. It also should take into account the site-specific nature of groundwater and the effects that various uses may have on the resource. Steps taken to protect the resource should be based on sound science, careful assessment of local conditions, and a balancing of the need to use and to protect the resource. EEI's policy with respect to these and other groundwater issues is set out in more detail in a policy statement entitled Groundwater: The Resource Management Challenge (June 1984).1/

Need for Federal Legislation, Funding Priorities (Questions 1, 11)

EEI supports enactment of legislation to provide federal funding, research, data sharing, and technical assistance focusing on groundwater science, the quality of the nation's groundwater, and management and protection of the resource. This information will be very helpful for states and industry in developing their own strategies to manage the resource.

At the same time, we urge Congress not to duplicate existing federal and state legislative and regulatory programs that address some of these same issues. As discussed below, a wide variety of existing programs include provisions for protecting and managing the resource similar to ones that Congress is now considering.

1/ This and other EEI documents referred to in this statement are available from C. Richard Bozek at EEI, (202) 778-6641.

For example, a number of federal statutes -- including the Comprehensive Environmental Response, Compensation, and Liability Act and the Superfund Amendments and Reauthorization Act (Superfund), the Resource Conservation and Recovery Act (RCRA), and the Safe Drinking Water Act (SDWA) -- already require the U.S. Environmental Protection Agency (EPA) to conduct research into the causes and effects of, and solutions for, groundwater contamination. EEI has identified these and other such federal programs in a report entitled Statutory Authorities for Federal Regulation of Groundwater Quality (February 1988).

Similarly, every state has some type of program for protecting and managing groundwater. Using tools such as aquifer mapping, aquifer classification, underground storage tank requirements, and land use controls, many of the states have made significant progress in managing this resource. EEI has summarized these programs in a report entitled State Programs for Groundwater Quality Management (December 1987).

Beyond research, funding, and technical assistance, Congress should not now enact provisions that impose strategies for managing and protecting groundwater. As Congress itself has recognized by proposing several groundwater research bills, the nation currently needs additional basic information about groundwater in order to manage the resource properly. Given this, Congress should avoid selecting and imposing management strategies until we have sufficient information to act wisely.

Until we know the quantity and quality of the nation's groundwater, the possible causes (natural and otherwise) of groundwater contamination, the movement of contaminants in the subsurface, and the number and type of uses of the resource, we should not take actions that ultimately may prove unnecessary or ineffective. This includes proposals that would require states to set groundwater standards or to issue groundwater permits.

Any legislation enacted should clearly delineate the roles and responsibilities of the various federal agencies as well as interaction of the federal and state governments. Only then can we avoid duplicating efforts and wasting resources.

In this regard, states should have the primary role in managing and protecting groundwater, with technical and financial assistance from the federal government as discussed above. When useful and appropriate, Congress ultimately may want to provide federal guidance for state groundwater management. However, states should retain the authority and flexibility to design their own programs to address their own concerns and the specific characteristics of their groundwater resources, given the highly complex and local nature of the resource and the variation in groundwater use (for farming, industry, municipal use) from state to state.

As among the federal agencies, the Department of Interior's U.S. Geological Survey (USGS) should have the lead on matters pertaining to groundwater science, hydrogeological technology, and monitoring and assessing groundwater quality and quantity. These are matters that the agency traditionally has handled well. At the same time, any health effects and source control research should be undertaken by an agency or agencies, such as the U.S. Environmental Protection Agency (EPA) and the Agency for Toxic Substances and Disease Registry (ATSDR), with expertise in this area. In addition to tapping the expertise of the agencies, this division of responsibility will avoid the administrative difficulties and cost involved in major changes of responsibility.

The concept of an inter-agency group to assist federal agencies in coordinating their efforts -- for example, as described in section 204 of H.R. 791 -- would appear to be sound.

As for funding, Congress should ensure that any legislation for groundwater research and assessment is sufficiently funded to allow the responsible federal agencies to perform the work required of them.

In conclusion, EEI believes that the highest priorities for federal groundwater legislation are funding, fundamental research, and technical assistance to the states and industry to assist them in developing groundwater quality programs. These programs should be based upon sound science that considers the local nature of the groundwater resource, ambient groundwater quality, present and potential use, and the degree of risk to human health and the environment.

Federal vs. State Roles (Question 2)

The management, protection and use of groundwater are matters that have historically fallen under state jurisdiction. This is quite appropriate, given the complex and site-specific nature of the resource, the variations nationwide in its availability and quality, and the different types of uses to which the resource is put in different states. For these reasons, the states should continue to play the lead role in managing the resource.

At the same time, many states do not have the funds, the staff, or the expertise to address all the issues that they face in managing and protecting groundwater. Nor is duplication of effort best use of limited state and federal resources. Support from the federal government in the form of research, funding, and technical assistance would be most useful.

Beyond this, it may be appropriate for the federal government to provide guidance for states in developing and implementing their groundwater management and protection programs. Any such guidance should have as its primary function to minimize degradation. But in determining the appropriate degree of resource protection, the guidance should provide for site-specific consideration of the resource, the degree of threat to human health and the environment, reasonable technology costs and benefits, and reasonable use of the groundwater for drinking water and other purposes.

In particular, states should be encouraged to use site-by-site analyses and tools such as aquifer classification, one example of which is described by EPA's Office of Ground-Water Protection in its _Ground-Water Protection Strategy_ (1984). Furthermore, states should retain the authority and flexibility to assess the physical characteristics of their local groundwater, state and regional needs for use of the resource, and appropriate methods for managing and protecting the resource.

Federal Agency Roles (Questions 5, 9)

As already mentioned, EEI supports USGS having the leadership role in federal research programs related to groundwater science (_e.g._, hydrogeology, geochemistry, groundwater modeling) and monitoring and assessing groundwater quality and quantity. USGS also should have the lead role in providing technical assistance on matters of hydrology, resource assessment/management, aquifer mapping, and data management. EPA should be directed to take into account relevant USGS research in exercising its groundwater-related regulatory responsibilities under RCRA, Superfund, and the SDWA.

On the other hand, health effects research should be conducted by agencies such as EPA and ATSDR. Indeed, much of this work is already being accomplished by these agencies under existing statutes, a situation that should be reflected in any new legislation that Congress enacts.

At the same time, the groundwater bills on which we are commenting would appear to be an inappropriate place to require health effects research and work such as risk assessment and development of groundwater quality criteria. These are costly and controversial endeavors. They are best used to respond to specific issues, such as the appropriate level for a drinking water standard, rather than being conducted as general exercises of the sort envisioned by the current legislation. Without consideration of site-specific conditions of fate, transport, exposure, and mitigative effects, such work is unlikely to have much practical value in dealing with actual groundwater problems.

Research and technical assistance related to remediation and treatment of groundwater and source control strategies also would most appropriately be the responsibility of an agency other than USGS, for example, EPA. However, EPA already has a large body of research, both completed and ongoing, that relates directly to groundwater remediation and source controls. Priority should be given to the dissemination of the results of this work before extensive new projects are undertaken.

Any Congressional legislation should focus on improving (1) the management of information by the federal agencies, and (2) the sharing of that information (as appropriate with confidentiality concerns in mind) among agencies, states, and outside parties. As part of a recent project, EEI had the opportunity to test the accessibility of USGS data bases and found such accessibility to be less than ideal. Therefore, EEI strongly supports the initiatives to improve current capabilities in the groundwater data management area. Increased emphasis on data management should be a high priority for any federal groundwater research program.

In addition, USGS and EPA should take into account groundwater research and information outside the federal government. For example, the Electric Power Research Institute conducts extensive research on the scientific and technical aspects of groundwater quality and management.

USGS National Water Quality Assessment Program (Question 7)

All three of the legislative proposals on which we are commenting include plans to conduct national assessments of groundwater quality (S. 1105, section 202; H.R. 791, section 205; and S. 20, section 6). In general, the schedules set out for these assessments are overly ambitious. The result would be either hastily done, inaccurate assessments or missed deadlines.

Moreover, national assessments would be likely to span lengthy time frames such that when the assessments were completed, the data collected would be obsolete and unrepresentative of current conditions.

With limited funding available to conduct groundwater research, it may be more beneficial to focus on regional and state assessments of groundwater quality which could be conducted in shorter time frames and which thus could be more valuable for state and local program development and assessment. Moreover, assessments called for by legislative proposals should be evaluated in light of ongoing efforts (e.g., the National Water Quality Assessment Program) in order to minimize duplication of effort and to apply available resources most efficiently.

EPA's Groundwater Classification System (Question 8)

EEI generally supports the use of classification systems based on groundwater quality and vulnerability, such as the one described in the EPA Ground-Water Protection Strategy mentioned above. Such federal and state classification systems can be a reasonable approach to managing and protecting groundwater resources.

EEI opposes legislative proposals that would require or encourage use of primary drinking water standards as ambient groundwater quality standards, especially where the standards would apply uniformly across each state. This would lead to overregulation and excessive protection by protecting as drinking water groundwater that will never be used for that purpose, including groundwater whose natural quality makes it unsuitable for drinking. Just as primary drinking water standards are not used as ambient water quality standards for all surface water, they should not be applied to all groundwater.

EEI also opposes proposals that would require or encourage use of nondegradation as an absolute management strategy, again especially where it would be used uniformly across the state. Almost every human activity has some potential to degrade groundwater. To avoid all such degradation would be extremely expensive, if not impossible, and would create unnecessary impacts on other media. A more balanced approach, such as risk management or aquifer classification, must be taken.

For further discussion of the primary drinking water standards and nondegradation issues, see comments on section 5 of S. 20 below.

Coordination of Federal Activities (Question 4)

EEI strongly encourages greater coordination of federal groundwater research, funding, and technical assistance activities. Greater coordination would assist in ensuring that federal and state programs are based on the latest research and should assist in minimizing duplication of research efforts. EEI supports the use of a mechanism which clearly spells out the roles, duties, and authorities of each federal agency involved in groundwater-related research. One such mechanism would be a refinement of the existing Memorandum of Understanding between EPA and USGS. Another is the inter-agency coordinating council discussed in H.R. 791.

Federal Groundwater Permits, Source Controls (Question 3)

The decision whether to use groundwater permits or other forms of source control should be left to the states. Several federal environmental statutes already establish source controls for a variety of potential groundwater pollution sources, as documented in the EEI report entitled Statutory Authorities for Federal Regulation of Groundwater Quality (February 1988). Beyond this, other sources of groundwater pollution are highly diverse and may not best be addressed by either permits or source control measures.

As EPA Administrator Lee Thomas pointed out in his testimony to the Subcommittees dated February 23, 1988 (at page 16), source control permits can "present major problems when applied to sources that are very numerous and diffused[.]" The sheer number of such sources can make a permitting system quite difficult to administer. In addition, as Mr. Thomas noted, "[t]echnology requirements needed to protect ground water should vary not only by the source to be controlled, but by the ground water hydrogeology and the risk to human health and the ecology." This makes use of uniform, widespread technology requirements improper and impractical.

Therefore, in evaluating their program needs, states should retain the authority and flexibility to determine the appropriate management and protection approach for each source. For example, instead of permitting, states may opt to use mixing zones, best management practices, or a host of other approaches for dealing with particular potential sources of groundwater contamination.

State Groundwater Programs (Questions 10, 12)

EEI research on state groundwater programs has confirmed the broad diversity of approaches to groundwater quality protection being pursued at the state level. It would not be appropriate to single out particular state programs as examples or models for other states to follow. Differences in state resource characteristics and management priorities necessitate individual tailoring of state programs to their particular needs and available funding.

Additional data, analysis of the experience of states in implementing their programs, and analysis of the efficiency, effectiveness, and impacts on regulated parties of the programs will be necessary before any particular component can be endorsed as a preferred option, even for specific circumstances. Further information on this subject is set out in EEI's study entitled State Programs for Groundwater Quality Management (December 1987).

University Research Programs (Question 6)

EEI supports strengthening and enhancing the continued efforts of the Water Resource Research Institutes at state universities (funded by USGS), in accordance with EEI's assessment that most groundwater issues should be addressed at the state level. Clearer delineation of research responsibilities among USGS, EPA, and other federal agencies should serve to strengthen the administration and support of research undertaken at these institutes.

SPECIFIC COMMENTS ON S. 1105, S. 20, H.R. 791

The following comments focus on S. 1105, with references as appropriate to S. 20 and H.R. 791. Section numbers refer to S. 1105 unless otherwise indicated.

Opening Sections

Section 4 - Definitions

Section 4(4) defines the term "contaminant" to include naturally-occurring constituents as well as anthropogenic ones. Therefore, care must be exercised in referring to "contaminant" elsewhere in the bill. It may be appropriate to include naturally-occurring constituents in the definition of contaminant because these too can degrade groundwater quality and should be considered in managing and protecting the resource. But some distinction should be made between natural and anthropogenic contaminants in choosing strategies for managing groundwater. For example, groundwater users should not be required to protect the resource to levels more stringent than background levels of contaminants. High levels of a naturally-occurring contaminant should neither automatically lead state or federal authorities to take remedial actions nor impel them to take inappropriate actions.

In section 4(17)(B), the definition of the term "source or potential source of contaminants" is too broad. Any substance has the potential to discharge into groundwater. As a result, virtually any site in the country, whether anthropogenically affected or not, would in all likelihood fall within this definition and thus would be subject to the requirements of S. 1105.

The definition of "nonprofit organization" in section 4(14) of S. 1105 and section 203(6) of H.R. 791 should be expanded to include Internal Revenue Code section 501(c)(6) organizations such as EEI. Trade associations such as EEI have conducted numerous studies on groundwater issues and can provide valuable input to EPA and USGS in implementing the provisions of S. 1105.

Title I - Environmental Protection Agency

Section 101 - Authorities, Areas of Investigation

EPA's duty to cooperate with USGS and other appropriate federal agencies in fulfilling its S. 1105 responsibilities is not well defined here or in Title IV. The inter-agency council approach of H.R. 791 would be one possible way to clarify the specific roles of the various agencies.

EPA's obligation to cooperate with the states in fulfilling its responsibilities is understated. This section of the bill indicates specific subject areas where EPA should cooperate with the states, but it does not contain a broad mandate to do so that mirrors EPA's duty to cooperate with other federal agencies. This should be corrected. The states should have a major role in setting EPA's groundwater research and data sharing agenda. We generally support the approach taken in section 204 of H.R. 791.

Similarly, EPA should be directed to work with private parties, including industry, in implementing its responsibilities under S. 1105. For example, such parties should have the opportunity to participate on any advisory boards that help to set EPA's research agenda. Again, we generally support the approach set out in section 204 of H.R. 791.

A number of areas of investigation assigned to EPA in this section of the bill more appropriately should be assigned to USGS in Title II. In particular, USGS should have the lead role in developing methods or techniques for monitoring and evaluating groundwater quality and flow, characterizing groundwater vulnerability, characterizing wellhead protection areas and zones of influence, and sampling groundwater. USGS also should have the lead role in modeling subsurface hydrogeology and the hydrologic relationship between groundwater and surface water. In addition, USGS may be the best agency to develop methods or techniques for detecting contamination, predicting the fate and movement of contaminants, and restoring contaminated groundwater.

A number of other areas of investigation in section 102 duplicate those being conducted under existing statutes. Source controls for leaking underground storage tanks, hazardous waste disposal, underground injection, and a myriad of other activities already have been or are being developed by EPA under statutes such as RCRA and the SDWA. Similarly, a number of other issues -- restoring contaminated groundwater, the human health effects of groundwater contaminants, methods for controlling discharges and reducing toxic pollution, and closure and post-closure care of potential sources -- are being addressed under these existing authorities. At a minimum, S. 1105 must reflect and coordinate with this ongoing work.

Section 103 - Control Technologies

While research to develop methods for controlling sources or potential sources of contamination may be useful, such research should be based on sound assessments of groundwater quality and potential sources of contamination. In addition, such research should be selected and conducted with advice from the states and private parties, including industry. S. 1105's constraint that research in this area should be undertaken only if it will not duplicate work already being conducted is quite appropriate.

Section 104 - Health Effects

In general, we oppose the requirements of section 104. As we already have indicated, much of the health effects research and related work that would be required by the section is being conducted by EPA and ATSDR under existing statutes. In addition, as a general research bill rather than a specific program statute, S. 1105 does not provide sufficient backdrop and focus for this work.

This section would likely duplicate work already completed or underway under a variety of other federal statutes, including Superfund, the SDWA, the Toxic Substances Control Act, the Clean Water Act (CWA), and the Occupational Safety and Health Act. For example, the chemical and physical properties, and the effects on human health and the environment, of most groundwater contaminants of concern are already being studied by EPA and ATSDR under Superfund. At a minimum, the research to be conducted under this section of S. 1105 must be coordinated with existing programs to avoid wasteful duplication.

Of the research authorities set out in section 104, the authority to investigate dispersion, persistence, and fate of groundwater contaminants is most likely to be useful. However, even this authority duplicates EPA authorities set out in section 101 of the bill. Furthermore, as mentioned above, this may be an area of responsibility that more appropriately should be given to USGS, not EPA.

If manufacturers and importers of groundwater contaminants ultimately are likely, under section 104(d)(4), to fund any health effects research that EPA conducts on the contaminants, these parties should be allowed the opportunity to undertake the research themselves, as described in section 104(d)(3). Furthermore, if these parties are to bear all or part of the costs of the research, they should be involved in the establishment of the research agenda. A majority of the research undertaken would probably involve compounds in widespread use and naturally-occurring substances; research on such "contaminants" should be funded by EPA.

Some of the substances identified in this section as targets for research may not be groundwater contaminants. For example, not all Superfund toxicological profile substances or CWA toxic/pretreatment constituents would necessarily be groundwater contaminants. At a minimum, Congress should exclude from the groundwater contaminant list such substances that would be inappropriate to list there.

In addition, one of the bases described in section 104 for listing contaminants on which health effects research is to be conducted raises a concern. Mandating that three or more detections of a substance nationwide automatically require EPA to list the substance and to conduct research on its health effects is likely to skew the agency's research priorities. At a minimum, EPA should have discretion not to list such substances if, in its judgment, they do not warrant a health effects research program.

The deadlines for listing constituents to be researched, proposing the research programs for those constituents, and completing the research would be unrealistic. Six months to list the constituents, 120 days to set the research agenda, and two years to complete the research "to the extent practical" are virtually impossible deadlines for any agency to meet. Moreover, the deadlines are not coordinated with those for the same activities under Superfund and the SDWA. More reasonable deadlines, coordinated with those of existing programs, would produce better results, allowing EPA sufficient time to develop and implement its research agenda with the care that such a costly undertaking deserves.

We are strongly opposed to section 104(a)(1), which states that the listing of groundwater contaminants is not an agency rulemaking and thus is not subject to public notice and comment under the Administrative Procedure Act. The best time to obtain public input on the health effects research process is early in the process, when EPA can adjust its priorities without expending major financial resources. If section 104 is retained in the legislation, we support the provision in section 104(b) requiring EPA to publish its research program proposals for public comment before proceeding with the programs. Moreover, in this case we recommend that Congress add a provision permitting public comment on research results or reports prior to their final publication.

Section 104 - Risk Assessment

Section 104 of S. 1105, section 207 of H.R. 791, and section 4 of S. 20 all contain provisions requiring EPA to analyze the risks posed by groundwater contaminants to human health and the environment at various concentrations. For a number of reasons, these bills -- especially the research bills -- would not be the appropriate vehicles for this requirement. First, sound risk analysis is an expensive and lengthy process; it is questionable whether it should be undertaken for all substances that these bills so broadly define as groundwater contaminants. Second, EPA already is conducting risk analyses for those substances of greatest concern as required by Superfund, the SDWA, the CWA, and other federal statutes. Finally, as we already have mentioned, generic risk analysis without consideration of fate, transport, exposure, and other site-specific factors would be of little or no value.

Again, the timetables for completing this work are unrealistic. In S. 1105, the risk assessments must be completed within 180 days of listing; in H.R. 791, EPA has 24 months to complete 30 assessments and another 12 months to complete another 30.

Section 106 - Assessments of Sources

Section 106 requires EPA to conduct a series of nationwide groundwater assessments. As proposed, these assessments are too broad in scope, and the bill imposes too short a time frame for their preparation. In addition, most of the sources listed for which assessments are to be conducted already are covered by existing federal programs: pesticides by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); landfills, surface impoundments, and waste piles by RCRA; injection wells by the SDWA; and publicly-owned treatment works by the CWA.

The requirement that EPA identify the number and distribution of the various sources, and their effects on each category of groundwater in each state, would likely overwhelm the agency. At a minimum, this would require significant cooperation and assistance from the states. More realistically, perhaps this work should be left to the states.

As for timing, the problem with conducting the assessments in the early stages of the groundwater program is that EPA would not have the benefit of the research that would be conducted simultaneously under other provisions of the bill. As a result, these assessments would be based on unreliable and outdated information. If these national groundwater assessments are necessary, EPA should be given a longer time frame in which to prepare them, they should be well designed and focused, and care must be exercised to ensure their scientific validity.

Section 107(b) - Peer Review

The directive that "all studies and results of studies under this Act shall be reported or adopted only after appropriate peer review" by a panel of disinterested scientific experts is a positive feature of the bill. As envisioned by section 210 of H.R. 791, input from the EPA Science Advisory Board should also be considered, though it should augment and not supplant the peer review process.

Title II - U.S. Geological Survey

Section 201 - Amendments to the Organic Act

In general, the authority and program responsibilities being assigned to USGS in this section of S. 1105 are appropriate and useful. EEI especially supports the regional aquifer systems analysis described in section 201(c)(3) -- focusing on groundwater quality, quantity, hydrogeology, modeling, and mapping -- to be conducted by USGS.

The USGS toxics hydrology program described in section 201(c)(4) would appear to duplicate similar work being assigned to EPA under Title I. In addition, as mentioned above in the Title I discussion, some of the other responsibilities being assigned to EPA in Title I may more appropriately belong here as USGS directives.

Section 202 - National Ground Water Quality Inventory

The requirement that USGS assess the quality and quantity of the nation's groundwater and groundwater information systems -- set forth here, in section 205 of H.R. 791, and in sections 6 and 8 of S. 20 -- is likely to produce useful information.

However, as we mentioned in the general policy section of this statement, attempting to assess the quality and quantity of the nation's groundwater could take so long that the data would be outdated by the time it were compiled. As an alternative, we recommend state or regional assessments.

In addition, the time frames for completing this work, one and a half to three years, are probably unachievable. This is especially true for any nationwide groundwater quality assessment that USGS would do.

Section 202(a)(1)(B) should be amended to include evaluation of the adequacy of existing federal data management programs. As mentioned above, EEI has found existing data somewhat difficult to use. A management-assessment report of the kind described in section 205(b) of H.R. 791 would be a good way to accomplish this.

For the same reason, section 202(b) guidance on the use of existing groundwater quantity and quality data would be most helpful. In addition, we are encouraged to see provision in this subsection for coordination of effort among federal and state agencies in order to avoid duplication of effort.

Title IV - General Provisions

Section 403 - Coordination

The requirement that the President coordinate "the research, development, and demonstration activities with respect to ground water quality and quantity conducted by the agencies of the United States" definitely should be included in the bill. If anything, the coordination should be more formally structured along the lines of section 204 of H.R. 791, using an inter-agency committee. Two good features of the H.R. 791 provision are the requirements that the committee consult with industry (among others) in determining groundwater research and information needs and that the committee hold public meetings semiannually.

Additional Features of S. 20

Section 5 - State Ground Water Protection Standards

As we already have indicated in our general policy discussion, EEI strongly believes that the decision whether to use a standard-setting approach to managing groundwater should be left to the states. In addition, EEI supports provisions such as section 5(b)(4) that permit states to accord specific groundwater systems more or less stringent degrees of protection.

Without a more reliable base of information on groundwater and on groundwater management tools likely to succeed in managing and protecting the resource, it is premature to compel states nationwide to engage in standard-setting exercises at this time.

As for specific standards to be set under S. 20, the requirement under section 5 that ambient groundwater standards shall be at least as strict as national primary drinking water standards, and the allowance for states to establish nondegradation standards, would be highly improper and infeasible.

Widespread reliance on drinking water standards in setting ambient groundwater quality standards would be inappropriate because it would not take into account: (1) groundwater use other than for drinking; (2) instances where ambient protection levels different from "at-the-tap" drinking water standards may be appropriate; and (3) natural groundwater quality that is already poorer than drinking water standards.

As an EEI study entitled Natural Quality of Groundwater in the United States Compared to Drinking Water Standards (September 1987) has shown, "conservatively, the natural quality of almost 60 percent of the nation's groundwater resources above depths of 2,500 feet would not meet all federal drinking water standards. This is contrary to the commonly held perception that the nation's groundwater resources are naturally pristine and of high quality." Volume I, page 9.

Use of drinking water standards as the basis for the development of ambient groundwater quality standards requires site-specific evaluations, especially with regard to groundwater remediation activities.

For several reasons, use of maximum contaminant level goals (MCLG's) as ambient groundwater quality standards would be even more inappropriate than use of drinking water standards. First, MCLG's do not consider the technical and economic feasibility of attainment, factors that are considered in setting maximum contaminant levels (MCL's or drinking water standards) based on MCLG's. Furthermore, set as theoretical ideals, MCLG's often are below detection limits, raising questions as to how they can be applied in practice. Promulgated under the SDWA only as an intermediate step on the way to determining drinking water standards, MCLG's are not even applied to public water systems under the very act that creates them. To apply them to groundwater users would be to apply standards stricter than the ones that public water systems are required to meet, a clear non sequitur.

As for broad use of nondegradation, it would impractical to achieve, considering that almost any level of human activity will cause some impact on surrounding environmental media. Furthermore, a literal application of a nondegradation standard is economically and technically infeasible.

Section 9 - Ground Water Protection Program

Because this section addresses implementation of standards, the preceding comments serve as a prelude to comments on this section. Every one of the sources of groundwater contamination listed in section 9(a)(3) currently is covered by one or more existing federal programs: solid and hazardous waste disposal, and underground storage tanks, RCRA; subsurface sewage disposal, the nonpoint source provisions of the CWA; pesticide use, FIFRA; and underground injection, the SDWA.

The program elements that states could use under section 9 -- regulations, voluntary controls, education, and other measures -- are sufficiently broad to accord the states a good deal of flexibility.

The timetable for states to establish their programs is ambitious. Three years to establish programs addressing major sources of groundwater contamination -- when EPA and the states are still assessing what those sources are -- would be extremely difficult to achieve.

* * * * * * * *

We appreciate the opportunity to submit this written statement to the Committee and Subcommittees. If you have any questions about this statement or wish to obtain the EEI documents or studies referred to, please contact C. Richard Bozek, Environmental Scientist at EEI, at (202) 778-6641.

NATIONAL
COAL
ASSOCIATION

COAL

RICHARD L. LAWSON
President
(202) 463-2647

April 7, 1988

The Honorable Max Baucus
Chairman, Hazardous Wastes and Toxic
Substances Subcommittee
Environment and Public Works Committee
458 Senate Dirksen Office Building
Washington, D.C. 20510

Dear Mr. Chairman:

The attached comments represent the National Coal Association's (NCA) concerns with respect to H.R. 791, S. 1105 and S. 20, and specifically respond to your subcommittee's groundwater questionnaire. NCA respectfully requests that these comments be made part of the record of the March 24th hearing which focused on these bills. It is NCA's understanding that the record is held open for two weeks after the date of the hearing for supplemental and additional statements.

U.S. coal mining operations already comply with a plethora of stringent environmental requirements specifically set forth to protect groundwater resources; most notably, those of the Surface Mining Control and Reclamation Act of 1977. Further federal programatic legislation aimed at additional regulation of the industry vis-a-vis groundwater resources (e.g. S.20 and S. 2091) is unnecessary and duplicative of existing requirements. In this same vein, NCA is opposed to bills such as S. 1105, which set the stage for comprehensive federal groundwater protection and management.

NCA is encouraged by the focus of H.R. 791 and by the support it would provide for the state's role in groundwater management. NCA does not oppose its provisions and looks forward to participating in specific research projects which would be carried forward under that legislation.

1130 Seventeenth Street, N.W.
Washington, D.C. 20036-4677
(202) 463-2625

The Honorable Max Baucus
April 7, 1988
Page Two

Should the Subcommittee have any questions on the position of the U.S. coal mining industry regarding specific groundwater issues or wishes further explanation of the attached comments, the membership of the National Coal Association and its staff will be happy to cooperate. We look forward to your thorough evaluation of our statement as your consideration of this issue continues.

Sincerely,

Richard L. Lawson

Richard L. Lawson

cc: Senator Dave Durenberger,
Ranking Minority Member
Senator Frank Lautenberg
Senator Barbara A. Mikulski
Senator Harry Reid
Senator Bob Graham
Senator John Chafee
Senator Alan Simpson
Senator Steve Symms

Enclosure

STATEMENT OF

THE NATIONAL COAL ASSOCIATION

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON WATER RESOURCES, TRANSPORTATION,
AND INFRASTRUCTURE
AND
SUBCOMMITTEE ON HAZARDOUS WASTES AND TOXIC SUBSTANCES

March 24, 1988

NCA is a trade association comprised of the nation's coal mining companies and ancillary service industries. Our member companies are actively involved in coal extraction, utilizing all of the standard mining methods and practices as they apply to the various types and occurrences of coal within the United States. Mining operations can affect ground water and, as a consequence, legislation on groundwater protection may influence how (or whether) these mining operations are conducted.

NCA believes that current Federal statutes are adequate to address the sources of contamination which the Federal government should be addressing. Furthermore, most state and local governments are making substantial progress in controlling potential sources of contaminants through siting and technology requirements, land use controls, and best managment practices. The Association of State and Interstate Water Pollution Control Administrators' has testified as to the efficacy and extent of state groundwater protection and management activities documenting that "77% of the states have comprehensive groundwater quality regulatory systems or protection strategies in place, and the remaining 23% will have such systems or strategies in place before the end of 1988. It is important to recognize that states already have a broad base of state legislation, regulation, and monitoring data with which to manage groundwater quality. As is evident by the existence of over a dozen Federal statutes which protect groundwater, and the state activities mentioned above, the programatic elements are in place to protect and manage groundwater resources both at the state and Federal level. To encourage and facilitate better communication and coordination of existing authorities, time must be afforded to allow the full benefit of these programs to take effect. Only then should an assessment of shortfalls be made and consideration of further federal action be contemplated.

NCA actively supports a groundwater protection strategy that is based on a multi-use concept featuring state implementation with the Federal role limited to research, technical support, education, and financial assistance. Consistent with this position, NCA is opposed to enactment of a comprehensive Federal groundwater protection measure (e.g. S.20 or S.2091) and research bills which are clearly intended as a prelude to Federal groundwater regulations (e.g. S.1105). NCA can, however, embrace the research and technical support program envisioned by H.R. 791 and, if enacted, would be willing to be an active participant in such activities.

There are a number of activities which affect groundwater quality while providing a needed benefit to society. All natural resource recovery activities can affect groundwater quality. These include farming, forestry, mining, oil and gas production, and even groundwater withdrawal itself. For example, mineral extraction may alter the chemical composition of the overlying strata, thus affecting the quality of the aquifer's recharge waters through percolation and leaching. Moreover, in many instances the coal resource, which is extracted, is the aquifer material itself.

The very act of mining modifies the groundwater system around the mine. The most obvious effect is that groundwater flows into the mine. This causes changes in the level of groundwater in the aquifer. Mining also breaks up the rocks which contain the minerals. Fresh rock surfaces are exposed to the weathering process. Groundwater passing over this broken rock can dissolve certain components of the rock as well as any weathering products.

These consequences of mining are unavoidable. We cannot prevent groundwater from entering the mine, nor can we prevent the dissolution of soluble components of the rock. This may limit the use of the groundwater in and around a mine. Clearly, we must minimize our impact to groundwater, (and do so already via strict adherence to the requirements of the Surface Mining Control and Reclamation Act, Clean Water Act, Safe Drinking Water Act, Toxic Substances Control Act, state and local statutes and ordinances) but just as clearly this nation cannot exist, as we know, without mining.

It must also be noted, however, that coal mining operations take place on a relatively small percentage of U.S. land area. For example, as of the end of 1986, the cumulative total of acreage permitted for coal mining operations - both surface and underground - was 3.4 million acres. Furthermore, while this amount represents land with potential for mining the reality is a vast amount of this area, is not and never will be mined. Inclusion of significant acreage in the "permit area" is required for buffer areas (i.e. undisturbed) and other activities which have little or no impact on groundwater. Thus, actual land area "disturbed" by coal operations in any given year is likely to be an order of magnitude less than the 3.4 million acre figure referenced above. This number, though inflated, may still be used to show the relative insignificance of the potential land disturbance vis-a-vis potential extent of groundwater impact of coal mining. This number represents only 1.1% of the 310 million acres of U.S. land currently under active crop and fruit orchard production for only .16% of the U.S. total surface area of roughly 2.24 billion acres.

The industry recognizes the need to manage groundwater in such a way as to both protect the environment and avoid unnecessary constraints on the siting and operation of coal mines. The optimum groundwater program will recognize the site-specific characteristics of the resource and its relative importance to society. It is inappropriate to premise groundwater regulatory decisions solely on protecting all aquifers for drinking water use or in their natural background condition when the most socially beneficial use of a particular groundwater formation may be for livestock watering, minerals development, or industrial uses.

Thus, management and protection must be vested in the individual states and based upon multi-use concepts that allow for differential levels of protection. At a minimum, some degradation should be allowed so long as overall integrity is maintained within the use category for which the aquifer was designated. The Federal government's role is best served by providing general guidance to ensure that the states are moving in the same general direction and basing decisions on good quality data. The Federal government should make available educational materials on groundwater management concepts, provide technical support to states upon request, and continue to collect data.

Answers to Subcommittee Groundwater Questionnaire

1. Is there a need for Federal groundwater legislation or are other Federal statutes adequately addressing this need (esp. SARA, RCRA, SDWA, CWA)

NCA sees no compelling arguments for any new legislative requirements for protection of groundwater particularly as it would apply to coal mining operations. Current Federal statutes already adequately address the protection and management of the resource, as do various state legislative and regulatory programs. Much to NCA's dismay, noticably absent from the list of Federal environmental statutes above, is the Surface Mining Control and Reclamation

Act (SMCRA). As will be addressed in depth later in these comments, SMCRA requires comprehensive identification of groundwater resources and requires coal mining operations to minimize effects of mining on the resource. (See answer to question 12 for details). Furthermore, coal mining operations also must comply with regulations under the Clean Water Act, Toxic Substances Control Act, Safe Drinking Water Act, Federal Insecticide Fungicide and Rodenticide Act, Comprehensive Environmental Response Compensation and Liability Act and other Federal environmental statutes. As one of the most environmentally conscious and regulated of American industries, the coal industry sees no need for enactment of yet another Federal statute. The protection and management of the resource is being addressed adequately by existing authorities.

A. Would a Federal statute weaken other existing Federal programs for groundwater?

To the extent that Federal legislation preempts or modifies pollution controls already in place, and creates conflicting requirements it could weaken present control plans and prevention policies. To the extent that legislation redefines present controls without considering whether the existing laws are effective, new legislation could actually weaken groundwater protection.

B. What efforts could be made to integrate and strengthen all these statutes?

Strengthening of existing statutes via legislative changes to them is unnecessary. However, the same effect can be achieved by enhancing coordination of activities already authorized under various statutes within and among government entities.

Moveover, without a lengthy evaluation of all present laws, it is not possible to define how to integrate and strengthen present statutes. For example, several of the proposed bills identify mine ponds as a potential source of groundwater pollution, but none of the justifications accompanying the bills mentions the detailed controls and groundwater impact evaluations already required of coal mines, including their ponds and impoundments, under SMCRA. Where new legislation assumes a gap but there actually is none, duplicative and conflicting requirements will result. This certainly does not integrate or strengthen the existing laws.

2. **Should the primary responsibility for groundwater management reside with state and local governments, or should there be a national goal set by the Federal government? If there is to be a national goal, which agency should set it and what should it be?**

The impacts of groundwater management decisions generally are localized and only very rarely is there any significant interstate groundwater impact. Therefore, the primary responsibility and authority for groundwater protection and management should and must reside with the state and local governments. The national need to protect groundwater is already stated in existing laws (e.g. SMCRA, CWA, CERCLA, SARA, RCRA, etc.) and these acts include goals and programs for groundwater protection. Any restatement of these goals, though unnecessary, should also be compatible with these existing directives.

If a central national goal or policy statement is determined as necessaary by Congress, it should be based upon minimization of impacts on groundwater quality yet clearly allow states the latitude to define "minimization" generally enough to address local conditions and needs. The latter concepts necessarily include consideration of use, value, and vulnerability of the specific groundwater resource and competing yet equally beneficial resource recovery or other societal needs.

Should there be a strict Federal nondegradation policy, a limited one, or should the states decide on nondegradation?

NCA strongly opposes a strict nondegradation policy. As alluded to earlier, mining, a massive earth moving operation, cannot proceed without causing at least some groundwater quality and/or quantity changes. Strict application of a nondegradation policy either on the Federal or state level would necessarily preclude mining and, for that matter, most other anthropogenic activities. Beyond this unacceptable degree, the state should have the authority to determine the extent to which degradation is permitted.

3. **Do you support Federal groundwater permits based on water quality criteria or Federal source controls based upon potential for groundwater contamination?**

NCA strongly opposes specific Federal groundwater permits or Federally prescribed source controls. Coal mining operations are already subject to an exhaustive state and/or Federal permitting process (SMCRA,CWA, etc.) which necessarily considers minimizing the effects on groundwater as part of the approval decision. An additional Federal level/permit would prove redundant (for coal) and administratively impracticable based upon the number of potential contaminant sources (e.g. septic tanks, surface impoundments, pesticide and fertilizer use, etc.). Furthermore, a permit system alone would not ensure additonal protection of groundwater.

If so for what sources?

N/A

4. **How should the activities of Federal agencies be coordinated — by a committee designated by statute, a statutorily designated lead agency, or should this be the responsibility of the President?**

Coordination of activities should not be prejudiced by statutorily mandating lead agencies. The creation of such could create confusion and limit the ability of agencies to carry out existing statutory missions. Coordination is essential, yet the President, as reflected by the recent establishment of a groundwater subcommittee of the Federal Coordinating Committee on Science Engineering and Technology (FCCSET) and various interagency Memorandum of Understanding (MOU), has in place existing mechanisms for that purpose.

5. **For each of the following functional activites describe the role you see each of the various Federal agencies playing (including the funding and institutional arrangements, where appropriate), regardless of whether you approve of the function itself being carried out by the Federal Government.**

Although the question is limited to addressing the Federal role in technical assistance or research, NCA does not believe it appropriate to preclude state and local agencies, universities or the private sector from participating in the development of necessary information and/or control technologies.

A. **Approving of state plans for assessment, monitoring protection, or management.**

As has been our experience under SMCRA, a legal requirement for Federal approval of state plans defeats the purpose of assigning states the lead role in assessing and addressing groundwater problems. There is no appropriate Federal role in this regard.

B. **Providing technical assistance on matters of hydrogeology, resource assessment, resource management, mapping of aquifers or recharge areas, or data management.**

The U.S. Geological Survey has and should continue to provide technical assistance in these areas. Their structure and expertise are best suited to accomplish these tasks.

C. **Providing technical assistance on matters of health effects, criteria setting, mitigation strategies, or remediation strategies.**

The EPA should provide the technical assistance on matters of health effects and criteria setting. The EPA in consultation with other federal and state agencies (e.g. Bureau of Mines, Office of Surface Mining, Department of Energy, and Department of Agriculture, etc.) should provide the technical assessments on mitigation strategies or remedial strategies. For example, the Abandoned Mine Land Program under the authority of SMCRA and administered by of OSM, will have particular import in coal mine related remediation. (see Question 12 for explanation of AML program).

D. **Operating an information clearinghouse providing indexing of data, of literature (technical and lay), and of sources of expert advice and services to state and local government.**

The USGS, DOI, DOE, EPA, USDA, etc. provide clearinghouses related to their regulatory and data gathering missions. NCA does not believe all information on groundwater could be effectively funnelled through one point at this time. This is particularly true given the magnitude of existing data, diversity of data quality and different monitoring methods and parameters catelogued by the various agencies. While NCA believes there is a great potential utility in a "central clearinghouse" and, in fact, could support establishment of such an entity in the future, NCA thinks that much activity must precede legislating such a mechanism.

For example, as an interim measure, each individual existing clearinghouse should re-evaluate its own method of data collection, parameters measured, the data's availability and utility to other interested parties, and, importantly, whether it is serving its intended goal. In this same spirit, the agencies should converse and compare data inventories and methodologies, working toward establishing more uniform and complimentary rather than duplicating data sets. These two steps may be undertaken now as a prelude to establishing a national/central clearinghouse at a time in the future. Statutorily mandating such a clearinghouse now, without recognition that these, intermediate steps are necessary and will take significant time to address, will surely lead to decreased, rather than increased overall utility of the existing groundwater data base.

E. **Conducting research on: hydrology, hydrogeology, fate and transport of chemicals in the subsurface, monitoring-network design, analysis of the vulnerability of groundwater to contamination.**

These functions should be split between USGS and EPA consistent with the answers given to earlier questions.

F. **Conducting research and development on techniques for preventing contamination from: agriculture, domestic waste disposal, industry (including extractive industries), and other sources.**

As a procedural matter, NCA takes exception to the focus of the question being based on "prevention" rather than minimization of contamination, for this suggests reliance on a nondegradation goal which, as expressed earlier, is unrealistic and is a misrepresentation to the American public.

To address the question, however, for extractive industries, particularly coal mining, the appropriate department to conduct research and development on techniques for minimization of contaminants is the Department of the Interior - through its Bureau of Mines and Office of Surface Mining.

G. **Conducting research on health and ecological effects of contaminants.**
As addressed earlier, the EPA should continue to have this authority.

H. **Conducting research and development on methods of remediation and treatment of contaminated groundwater.**

For the mining industry the Bureau of Mines and Office of Surface Mining are the appropriate entities to conduct research and development on methods of remediation and treatment of contaminated groundwater associated with coal mining related operations.

I. **Issuing health advisories.**

EPA should continue to issue health advisories as part of its responsibility under the Safe Drinking Water Act.

J. **Conducting resource assessments.**

National resource assessments are and should continue to be conducted by the USGS. As part of site specific or emergency clean up activities, however, the EPA or another authorized body, may need to conduct its own assessment (e.g.the AML program under SMCRA or a CERCLA site cleanup).

6. **How should the needed university research and educational programs related to groundwater be strengthened (e.g. institutes, fellowships, competitive research grant programs) and how should these be administered?**

- **The Water Resources Research Act (P.L. 98-242) is authorized through 1989. This Act funds 54 research institutions on a 40/60 federal-state**

matching basis. How can this program be incorporated into the new groundwater bills?

Although NCA is not overly familiar with much of the research conducted by the universities - funded either by EPA or the USGS under P.L. 98-242 - it is our desire to assure that any such research is well defined and focused on a specific need. Time tables and adherence to "scope of work" should be scrutinized by periodic oversight by the funding agency. This will help assure best use of limited funds.

7. **Comment on the USGS National Water Quality Assessment Program and how that relates to any of the assessments and studies in S. 20, S. 1105 and H.R. 791.**
   - **Are the time frames for these assessments and studies reasonable?**

Beginning in 1986, the Congress has annually appropriated funds for the U.S. Geological Survey to test and refine concepts for a National Water Quality Assessment (NAWQA) Program. The program is intended to address a wide range of national water-quality issues that include chemical contamination, acidification, eutrophication, salinity, sedimentation, and sanitary quality. The goals of the program are to:

1.) Provide nationally consistent descriptions of current water-quality conditions for a large part of the Nation's water resources; 2.) Define long-term trends (or lack of trends) in water quality; and 3.) Identify and describe the relations of current conditions and trends in water quality to natural and human factors.

This information will be provided to water managers, policymakers, and the public to provide an improved scientific basis for evaluating the effectiveness of water-quality management programs and for predicting the likely effects of contemplated changes in land and water-management practices. At present the program is in a pilot phase with field studies occurring in seven areas around the Nation. In 1990, a committee of the National Academy of Sciences will complete an evaluation of the design and potential utility of the program. A decision about moving to full-scale implementation will be made upon completion of this evaluation.

It is NCA's opinion that the results of the NAS review should be awaited and used to determine whether NAWQA should be expanded or replaced by another mechanism. It would be premature to address how this pilot study relates to any of the bill assessments; for the former is evolutionary.

Additionally, however, many other assessments are currently being carried out by government agencies as part of their regulatory mission. For example, EPA is assessing groundwater contaminants by pesticides and conducting others relative to their wellhead protection, sole source aquifer protection, underground storage tank, and many other programs. From this experience it is clear that most assessments in newly proposed legislation have unreasonably short completion times that will simply cause inefficiency and delay. The proposed bills at issue here are no exception.

8. **Comment on EPA's classification scheme and how it relates to each of the three bills.**

NCA submitted substantive comments to EPA in March of 1987 pertaining to its draft groundwater classification scheme. To address the first part of question 8 we attach for your review a copy of those comments. As for the remainder of the question, there are many similarities and differences between EPA's classification and that outlined in S. 20.

On a positive note, the EPA strategy and S. 20 envision differential protection of the groundwater resource. NCA applauds the incorporation of this concept. However, whereas EPA's system sets out a logical progression for reasoned decision making regarding addressing groundwater contamination, prevention, and cleanup; S. 20 is designed to set a rigid framework (and minimum ambient standards) for all groundwater decisions — including many now appropriately made by the states. Furthermore, while EPA's classifications would be used in conjunction with site-specific regulatory decisons, S. 20 contemplates an anticipatory and aquifer-wide classification system. NCA is strongly opposed to the latter. Our concern stems from our experience under the Clean Water Acts' Stream Use Designation Process, which seems akin to that contemplated by S. 20 for aquifers. Such a process is necessarily overly rigid. Since it takes a "snapshot" in time, and due to the "magnitude" of the chore and limited time allotted, the process yields classifications which fail to reflect on the ground circumstances and characteristics. This has lead to overly constrictive designations which have little or no basis in fact.

S. 1105 does not contain a classification system. However, by broadly defining groundwater and by determining acceptable concentrations of contaminants based solely on health effects, it presumes protecting all groundwater to drinking water standards. Unless it is broadened to investigate acceptable groundwater contaminants and their concentrations for other uses, and natural background conditions, it appears to lead to a more restrictive classification system than either S. 20 or the EPA classification; and one under which it is perhaps impossible for extractive industries to operate.

9. **To what extent should the Federal government concern itself with groundwater depletion? — research only? regulation?**

The Federal Government does not have a role in issues relative to availability/allocation of groundwater. The depletion of groundwater should be viewed as a question of resource extraction not unlike extraction of oil, gas, coal, etc. The rules governing rate of pumping have always been a matter of state responsibility and should remain that way. However, the Bureau of Reclamation and the USGS may properly have a research role regarding aquifer recharge.

10. **To what degree are states using land use controls to prevent groundwater contamination?**

NCA does not have any unique expertise as to specific state and local land use restrictions, however, we suggest contacting groups such as the Interstate Conference on Water Policy and the Association of State and Interstate Water Pollution Control Administrators, for this information and insight into this matter. It is our understanding, however, that most, if not all states and municipalities have this mechanism at their disposal to protect these resources, and have probably applied them in particular circumstances.

11. Given limited fiscal resources what are the priority programs and activities to fund in these bills?

Of the allocation methods and priorities identified among the three bills, the priorities and objectives of H.R. 791 are the best and most realistic. For these reasons, NCA is able to support the principles and research activities put forth by H.R. 791. The highest priority should be placed on assessing groundwater quality and quantity. Next in priority should be research into the effects of organic and inorganic contaminants. Last in funding priority would be research liason with universities for consideration of ongoing problems and their solutions.

12. Please point out any exemplary state groundwater programs or add any other comments not covered in your statement.

NCA is not the best equipped to answer the first part of question 12, particularly since coal mining does not occur in every state in the union. However, relative to additional points NCA believes necessary to raise, it is important for committee members and staff to realize the breadth of statutory requirements aimed at protecting groundwater placed on U.S. coal mining operations. While the majority of these requirements stem from compliance with SMCRA, coal mining operations also fall subject to provisions of the CWA, SDWA, TSCA, FIFRA, CERCA, and other Federal and state statutes which either directly or indirectly protect groundwater. The following outlines some of the major requirements of a few of these statutes as they apply to coal mining operations vis-a-vis groundwater protection.

Requirements of the Surface Mining Control and Reclamation Act of 1977

Under the Surface Mining Control and Reclamation Act (SMCRA), all surface and underground coal mines must obtain a permit. To be granted a SMCRA permit, a lengthy and in-depth permit application process must be followed. The application for a permit must include substantial and detailed geologic and environmental data in addition to a determination of the "Probable Hydrologic Consequences" (PHC) of the mining and reclamation activities — both on and off the mine site. Specifically, Section 507(b)(11) requires:

> (11) a determination of the probable hydrologic consequences of the mining and reclamation operations, both on and off the mine site, with respect to the hydrologic regime, quantity and quality of water in surface and groundwater systems including the dissolved and suspended solids under seasonal flow conditions and the collection of sufficient data for the mine site and surrounding areas so that an assessment can be made by the regulatory authority of the probable cumulative impacts of all anticipated mining in the area upon the hydrology of the area and particularly upon water availability.

Section 508 of SMCRA contains reclamation plan requirements which include a detailed description of measures to be taken during mining to assure the protection of surface and groundwater systems. Specifically, Section 508(a)(13) requires -

> . . .a detailed description of the measures to be taken during the mining and reclamation process to assure the protection of:

> (A) the quality of surface and groundwater systems, both on and off-site, from adverse effects of the mining and reclamation process;
>
> (B) the rights of present users of such water; and
> (C) the quantity of surface and groundwater systems both on and off-site, from adverse effects of the mining and reclamation process or to provide alternative sources of water where such protection of quantity cannot be assured;

In addition to the above requirements for permit approval, Section 510 (b)(3) of SMCRA provides that the permit cannot be granted unless -

> (3) the assessment of the probable cumulative impact of all anticipated mining in the area on the hydrologic balance specified in Section 507(b) has been made by the regulatory authority and the proposed operation thereof has been designed to prevent material damage to hydrologic balance outside the permit area;

Comprehensive environmental protection standards are contained in Section 515 of SMCRA (Section 516 for underground mines). Section 515 (b)(10) provides for groundwater protection as set forth below:

> (10) Minimize the disturbances to the prevailing hydrologic balance at the mine site and in associated offsite areas and to the quality and quantity of water in surface and groundwater systems both during and after surface coal mining operations and during reclamation by -
>
> > (A) avoiding acid or other toxic mine drainage by such measures as, but not limited to -
> >
> > > (i) preventing or removing water from contact with toxic producing deposits;
> > >
> > > (ii) treating drainage to reduce toxic content which adversely affects downstream water upon being released to water courses;
> > >
> > > (iii) casing, sealing, or otherwise managing boreholes, shafts, and wells and keep acid or other toxic drainage from entering ground and surface waters. . . .
> >
> > (D) restoring recharge capacity of the mined area to approximate premining conditions;

Extraordinary protections are afforded to "Alluvial Valley Floors" defined in Section 701(l) of SMCRA as:

> . . .The unconsolidated stream laid deposits holding streams where water availability is sufficient for sub-irrigation or flood irrigation agricultural activities. . . .

For instance, Section 510(b)(5) provides:

> The proposed surface coal mining operation if located west of the 100th meridian west longitude would -
>
> (A) not interrupt, discontinue, or preclude farming on alluvial valley floors that are irrigated or naturally sub-irrigated. . .
>
> (B) not materially damage the quantity or quality of water in surface or underground water systems that supply these valley floors. . . .

Moreover, Section 515 (b) (10) (F) provides for

> (F) preserving throughout the mining and reclamation process the essential hydrologic functions of the alluvial valley floors in the arid and semi-arid areas of the country;

Operations currently mining in such areas, as well as many others, are required to install sophisticated monitoring systems to assure compliance with the above provisions. Furthermore, SMCRA provides for the protection of fish and wildlife resources and habitats, including surface and groundwater related values. Section 515 (b) (24) and Section 516 (b) (11) of the SMCRA require surface and underground coal mining operations -

> To the extent possible using the best technology currently available, minimize disturbances and adverse impacts of the operation on fish, wildlife, and related environmental values, and achieve improvement of such resources where practicable.

In addition, Section 515 (b) (2) of the Act requires that the operator restore mined land:

> ...to a condition capable of supporting the uses which it was capable of supporting prior to mining or higher or better uses of which there is reasonable likelihood, so long as such use or uses do not present any actual or probable threat of water diminution or pollution. . . .

If these examples are not enough to establish the fact that SMCRA permitting requirements adequately consider and protect groundwater and related resources during and subsequent to coal extraction, there are additional safeguards contained within SMCRA. The most significant to note is Section 522 (a)(3) which establishes a procedure for designating areas unsuitable for coal mining. Among other things, grounds for making the determination include that such operations will -

> (A) be incompatible with existing state or local land use plans or programs; or
>
> (B) affect fragile or historic lands in which such operations could result in significant damage to important historic, cultural, scientific and aesthetic values and natural systems, or

> (C) affect renewable resource lands in which such operations could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products, and such lands to include aquifers and aquifer recharge areas; or . . . .(emphasis added)

As an additional mechanism to assure environmentally sound mining practices and reclamation activities, Section 509 requires substantial performance bonds be filed, prior to permit issuance;

". . .payable, as appropriate, to the United States or to the state, and conditional upon faithful performance of all the requirements of the Act."

The amount of the bond, which in some cases is tens to hundreds of millions of dollars, depends upon the reclamation requirements of the approved permit and;

> "shall reflect the probable difficulty of reclamation giving consideration to such factors as topography, geology of the sight, hydrology, and revegetation potential. . . ." (emphasis added)

For pre-SMCRA coal mining sites which were abandoned (i.e. left in an environmentally unsound fashion), a trust fund known as the Abandoned Mine Reclamation Fund was created. This trust is funded by a reclamation fee, applicable to all coal mining operations subject to SMCRA, in the amount of:

> "35 cents per ton of coal produced by surface coal mining and 15 cents per ton of coal produced by underground mining or 10 per centum of the value of the coal at the mine. . ."

Monies from the fund are to be used for:

> (1) reclamation and restoration of land and water resources adversely affected by past coal mining, including but not limited to reclamation and restoration of abandoned surface mine areas, abandoned coal processing areas, and abandoned coal refuse disposal areas; sealing and filling abandoned deep mine entries and voids; planting of land adversely affected by past coal mining to prevent erosion and sedimentation; prevention, abatement, treatment, and control of water pollution created by coal mine drainage including restoration of stream beds, and construction and operation of water treatment plants;

As demonstrated above, coal mining operations in the United States are already required to protect groundwater resources in a manner consistent with the goals of the EPA strategy and the bills currently before the committee. If the potential for long-term or irreparable damage is high, the mine will not be permitted. Moreover, mines failing to meet the requirements of the Act are subject to strict civil and/or criminal penalties, mitigation measures and, if determined to pose an imminent danger, must be closed down.

Therefore, NCA believes that only SMCRA should apply to the protection of groundwater in coal mining operations rather than being subject to dual programs and an "additional step in site-specific analysis" as proposed by EPA or subject to the provisions of S. 20 or other "comprehensive" groundwater bills. Groundwater protection relative to coal mining operations should remain within the exclusive jurisdiction of the Surface Mining Control and Reclamation Act of 1977.

Beyond SMCRA, U.S. coal operations are subject to stringent requirements of the Clean Water Act. Although most view the CWA as a measure to protect only surface waters, ground and surface waters are inescapably linked. Thus cleaning/preventing contamination of one, will have a beneficial effect on the other. In this regard, it is important to note that coal mining operations are subject to many provisions of the CWA such as Section 404 "dredge and fill" provisions - and, perhaps more important, to sections 304 and 307 relative to point source effluent guidelines and protection of in-stream quality. In fact, U.S. coal mining operations have been subject to specific effluent limitations since 1977.

Coal mining operations also contributes to the CERCLA fund for cleanup of hazardous waste sites - presumably protecting groundwater resources. Further, coal mining operations are subject to provisions which stem from the underground storage tank program, well-head protection program, PCB disposal requirements and other specific components of the SDWA, TSCA, FIFRA and other statutes designed to safeguard against groundwater contamination.

The list of statutory requirements for the protection of groundwater to which U.S. coal mines are subject is substantial, and, therefore, no additional controls on this sector of U.S. industry is believed warranted by NCA.

If the Committee has any questions as to the provisions or implementating regulations of the statutes raised above - as they apply to coal mines or wish further examples, the membership of the National Coal Association and its staff will be happy to cooperate. In closing, NCA does not believe that Federal programatic legislation is necessary at this time (e.g. S.20 and S. 2091), or bills such as S. 1105 which sets the stage for such legislation.

GROUND WATER PROTECTION

TUESDAY, MAY 17, 1988

U.S. Senate, Committee on Environment and Public Works, Subcommittees on Water Resources, Transportation, and Infrastructure, and Hazardous Waste and Toxic Substances

Washington, DC.

The subcommittees met, pursuant to notice, at 9:54 a.m., in room 406, Dirksen Senate Office Building, Hon. Frank R. Lautenberg (acting chairman) presiding.

Present: Senators Burdick, Baucus, Lautenberg, Graham, Chafee, Symms, and Durenberger.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator Lautenberg [presiding]. I will call this subcommittee meeting to order.

Chairman Baucus is on his way. Unfortunately, we have been delayed because of a vote that just took place, but I would like to be responsive to the witnesses' needs to move on. The chairman will make his statement when he arrives, and I will just make a brief statement before inviting each of you to make yours.

This bill, H.R. 791, would require States to develop programs, according to Federal standards, to prevent ground water contamination. I look forward to working with the committee in addressing this serious national problem.

According to the OTA, ground water contamination has occurred in every State and is being detected with increasing frequency. This contamination has adverse health, social, environmental, and economic impacts which are likely to increase if we fail to act.

Although a number of statutes address aspects of the ground water problem, there is an urgent need to fill the gaps and weaknesses left by these laws. The time has come to establish a comprehensive program to protect the quality of the Nation's ground water.

Ground water is of special significance in our State, Senator Bradley. Over 50 percent of the people in New Jersey get their drinking water from ground water supplies.

EPA has designated four ground water sources in New Jersey serving over 800,000 people as sole source aquifers, and EPA is considering designating two other ground water sources serving over 3 million people. Fortunately, New Jersey has a sufficient supply of quality ground water for most users throughout the State.

There are, however, some serious local problems. Since 1970, nearly 1200 wells have been closed because of contamination from organic compounds, and another 200 wells have been closed because of other contaminants.

A 1985 State survey found that 18 percent of New Jersey's public water supplies had detectable concentrations of one or more organic contaminants. These figures provide sufficient warning to us for the need to take strong action to prevent ground water contamination.

It is distressing that in the fact of these threats, EPA continues to oppose the efforts of the Environment Committee to pass legislation to prevent ground water contamination.

I am pleased that my distinguished senior colleague, Senator Bill Bradley, is here to testify on the issue. As Chairman of the Senate Energy and Natural Resources Committee's Subcommittee on Water and Power, he has a keen awareness of the importance and the need to protect ground water in the country and in New Jersey.

I am also looking forward to hearing from our good friend and colleague from the other side, Congressman Sam Gejdenson from Connecticut. We look forward to hearing his testimony as well.

Senator Bradley, welcome.

STATEMENT OF HON. BILL BRADLEY, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator **Bradley**. Thank you very much, Mr. Chairman, and it is a pleasure to call you Mr. Chairman in the Environment and Public Works Committee, because I know of our shared interest in so many things—ground water being but one. I feel very comfortable with you in the chair, knowing your interests in these issues.

Today marks this committee's third hearing on legislation for ground water management and research. Such a commitment of time shows the seriousness of your efforts and the need for action by this Congress.

Mr. Chairman, I could say that your own efforts here have been significant and continuing and show a real sensitivity to the needs of people of New Jersey as well as to the whole country.

During the past year, I have chaired three hearings in the Subcommittee on Water and Power. Government, industry, environmental organizations, and academics all testified at those hearings. While the witnesses disagreed on some policy recommendations and courses of action, inaction was never suggested as a preferred strategy.

As a result of these hearings, I have tentatively reached a number of conclusions.

First, while we are not in a crisis, we are at a threshold. The choices we make today will determine whether ground water will be available for our future and our children's future.

Much of the nation depends on ground water supplies. Over 120 million people, including 95 percent of rural Americans, rely on ground water. Without adequate planning, their future is in jeopardy, and we frankly can't allow that to happen.

Second, preventing contamination is essential if we are to protect ground water resources for the future. Unfortunately, we know too well from experience the extreme cost and near impossibility of cleaning up ground water supplies once they become contaminated.

Mr. Chairman, in our State, New Jersey, there is growing concern over contamination. Over 1000 wells in the State have been closed, probably forever. We can't afford to pollute our ground water today. The price we would have to pay tomorrow is simply too great.

Finally, we need to augment and restructure Federal programs in order to provide the information decision makers need to prevent contamination from crippling our ground water supply and our future.

Mr. Chairman, today you will hear testimony on a number of Senate bills as well as H.R. 791, the Ground Water Research Act, which passed the House last December. The opportunity is clearly at hand to address ground water issues in a comprehensive fashion in this Congress. The House has already acted, and the Senate, I believe, should follow suit quickly, because time is very short.

However, rather than address the specific contents of any of these bills now before the committee, I would like to sketch my own view of how we might elevate ground water policy to a more appropriate and visible level. There is much the Federal Government can and should do to lead the way on ground water quality.

First, our government must ensure that its own house is in order. With this in mind, last February, I introduced the Reclamation Groundwater Act which Senator Moynihan cosponsored. This small bill charges the Bureau of Reclamation, the manager and builder of massive water projects in most of our western States, to recognize and evaluate the impact on ground water which stems from the Bureau's efforts to control surface water supplies.

The Bureau is not the only Federal agency, however, whose actions alter ground water flows or quality. For instance, the Army Corps projects have an impact, as well as agricultural or Federal land management policies. Frankly, we need an across-the-board assessment of the impact of Federal programs on ground water, and we should make appropriate adjustments, then, to our policies.

My second thought is, as I have said earlier, that the role of the Federal Government as the lead agency in ground water research needs to be augmented. There are clear economies of scale in these research efforts, for example, developing the analytical tools to evaluate complex ground water flows or assessing the health effects of chemical contaminants. The Federal Government is in a unique position to aid needy States.

Currently, there are programs that could be expanded. For instance, the U.S. Geological Survey has a well respected cooperative program used in New Jersey. Traditionally, the States' demand for help has exceeded the USGS's capability. Also, as State ground water programs evolve, it will be crucial to have sufficient flexibility in the Federal role to adjust to evolving needs. It is not adequate to emphasize simply the size of the budget or manpower levels or particular program milestones.

Finally, we need to acknowledge the complexity of ground water management. At this time, the Federal role could be one that is fundamentally supportive of State initiatives. It seems premature to discuss a massive Federal program when so many State activities are just gearing up, in many cases, in response to Federal initiatives.

There are already success stories. Iowa, for example, is leading the way in the management of pesticides, notwithstanding the dominant position of agriculture in the State's economy.

The Federal Government needs to encourage these wide-ranging State efforts through financial incentives, complementary research programs, and general guidelines and goals.

Mr. Chairman, I have said we are at a threshold. We need to move forward this Congress but with some care and prudence. Built into any legislation should be provisions for subsequent Congressional review as we develop better insight into this complex problem.

I ask you and the committee to act quickly on ground water legislation, and I offer the cooperation of the Subcommittee on Water and Power in promoting such legislation before the full Senate.

I thank you very much for the opportunity to testify.

Senator **Lautenberg**. Thank you very much, Senator Bradley.

I wonder, Congressman Gejdenson, since Senator Bradley has other things on his agenda this morning, if we can excuse him.

Senator Bradley, before you go, although I, in the team of New Jersey Senators, sit on the Environment Committee, no one has taken a more aggressive position on matters affecting the environment, and, as usual, I look forward to working with you on this as well as so many other things that we are concerned about.

Thank you very much for being here with us.

Senator **Bradley**. Thank you, Mr. Chairman. I appreciate it.

Senator **Lautenberg**. Congressman, welcome.

STATEMENT OF HON. SAM GEJDENSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CONNECTICUT

Mr. **Gejdenson**. Thank you, Mr. Chairman.

I appreciate the time and the courtesy given to me by you at this hearing and would only preface my remarks by saying that Senator Bradley's statement on the issue really does do an excellent job of covering the many facets of what we have to deal with.

As an original sponsor of H.R. 791, I thank you for holding this hearing today. Clearly, what we are facing is a critical period when a precious resource of our nation can be saved and properly managed or can be squandered.

Ground water contamination is one of the most serious environmental problems facing this nation. In my home State, as in yours, we have had more than 1000 wells contaminated, 200 of those in the last several years alone.

Unfortunately, there are major barriers to protection of ground water. A significant portion of that is the failure to have at hand some fundamental information. The primary purpose of H.R. 791 is to provide Federal, State, and local decision makers with the information they need to solve the ground water problems.

H.R. 791 authorizes a comprehensive Federal ground water research effort by the Interior Department, the Environmental Protection Agency, and the Department of Agriculture's USDA. The bill establishes an interagency ground water research committee to coordinate the efforts of the different agencies and to ensure that there is no duplication of research efforts.

This legislation recognizes and increases the strength of the Federal agencies with major ground water research responsibilities. Within the Interior Department, the Geological Survey is given the responsibility for research on ground water quality and quantity. EPA is given responsibility for health effects research, risk assessment, and other research related to its regulatory mission. Finally, the USDA is directed to encourage farmers to use farming practices which do not contribute to ground water contamination.

H.R. 791 is the product of over two years of work by the House of Representatives. In an extraordinary display of cooperation, we have had five House committees, Interior, Energy and Commerce, Public Works, Science, and Agriculture, agree on a consensus version of the bill which was sent to the House floor and was passed by a vote of 399 to 14.

On May 26, my Subcommittee on General Oversight of the Interior Committee will hold a hearing on any additional regulation needed by the Federal Government. I would agree with Senator Bradley that I would hope we would not try to set the regulations in place and do a comprehensive regulatory bill until we have developed some of the vital information to make sure that we are heading in the right direction.

I would simply close by thanking you for holding this hearing. Often, we in Washington are accused in engaging in costly programs. Well, in this case, what is clear is that inaction is far more costly than action.

People's homes are at risk, their families are at risk, and, as both of us know, you need only talk to a family whose children have been exposed to carcinogenic chemicals as a result of contaminated ground water and whose home may now be worthless because of the unavailability of a potable water supply to understand how critical this need is.

I thank you for the time you have given me this morning.

Senator LAUTENBERG. Thank you very much, Congressman. I know of your active interest in environmental issues.

In States like ours, the densely populated States and States small in size—powerful in ideas and ingenuity—the problems of the environment are real. It often is the difference between a healthful existence and a threatening existence, particularly as it affects water supplies.

We are beginning to find in New Jersey alarming signs that contamination goes beyond some of the traditional ground water supplies. Besides the well closings, there is a suspicion that there is contamination almost throughout our water system, and that is very dangerous, as you say.

Mr. GEJDENSON. I grew up on a dairy farm, and I can remember doing things that just are shocking today, because there was no information available, no guidelines. We used chemicals as dangerous as trichloroethylene to degrease an engine before we worked on it with no warning, no indication that it might be dangerous. Today, I think, the snare level for trichloroethylene is 9 parts per billion.

Farmers who used solvents and what have you had no place to dispose of them, and they were generally thrown out in the back yard somewhere not far from their own wells.

So, I think the public is desirous of information. The State and local governments want to work with the Federal Government, and the legislation we are looking at here today could go a long way to do that.

Senator LAUTENBERG. We thank you for being here with us this morning. We look forward to working with you on this issue and many more in which we have a common interest.

Mr. GEJDENSON. Thank you, Mr. Chairman.

Senator LAUTENBERG. I would like to call Ms. Chelimsky now.

Ms. Chelimsky, we welcome you, and we invite you to present your testimony. Though the chairman isn't here at the moment, he has requested that we take your testimony. Please make it brief, if you will. The full text of your testimony will be entered into the record, and we thank you for coming here.

I understand that you have a couple of people who are going to join you. We would like you to introduce your associates, please.

STATEMENT OF ELEANOR CHELIMSKY, DIRECTOR, PROGRAM EVALUATION AND METHODOLOGY, GENERAL ACCOUNTING OFFICE, ACCOMPANIED BY BORIS KACHURA, KEN LITKOWSKI, AND DAN ENGELBERG

Ms. CHELIMSKY. Good morning, Mr. Chairman. I was just about to ask you if we could just summarize and then have it in the record. You are way ahead of me.

I have with me Boris Kachura who was the group director for the two studies that we performed at the GAO on ground water contamination. To my left is Ken Litkowski, and on his left is Dan Engelberg. Both of them were project managers for each of the studies, respectively. I thought it would be good to have them here if you had some detailed questions that you wanted to ask.

As you know, Senator Baucus of this committee asked us to take a look at the efforts that State governments were making to protect their ground water resources and at the information the Environmental Protection Agency was making available to them to help them set technically sound ground water standards.

We focused our attention largely on standard setting, what the status is, how it is progressing, and what is needed. Our basic methodology was to conduct a detailed survey of all 50 States and 7 territories of the United States. We had a 100 percent response rate. That is not unusual for the GAO, but it is nice. And our findings are, of course, generalizable to the nation.

I have seven findings to report to you today.

First, it is clear that States have not awaited the arrival of a Federal program to establish ground water standards. Instead, 41 of the 57 respondent States and territories have set their own numeric or narrative standards but only for some contaminants and at a very slow pace.

However, it is also the case that 16 States have set no standards at all. You might want to take a look at Table 6 which is on page 12 of our statement to get some sense of the basic data.

The second finding is that the median number of contaminants now regulated by State statute is 35. Our data suggest that between 40 and 220 numeric standards are being added each year across all States and territories with most of the new standards being adopted by States that previously had none.

Now, the problem here is that there are hundreds of contaminants. At this rate, it could take 40 years to adopt numeric standards in all States for half the contaminants now being regulated in New York.

Third, in addition to the slow pace, we found that because of the lack of Federal leadership, there was duplication of effort in collecting and analyzing information in the States. There were also problems of technical capacity to develop standards. Indeed, the chief reason given by State respondents for the failure to develop numeric standards was insufficient technical expertise.

The fourth finding is that there is enormous variability across States with regard to numeric and narrative standards. However, there seems to be little appetite among our State respondents for keeping things disparate or inconsistent.

Instead, the great majority of State officials favored interstate consistency on ground water standards for a whole variety of reasons. Ground water migration across State boundaries is certainly one of them.

Fifth, State officials feel that there is inadequate data emanating from the Federal Government. They told us they don't have the technical and other resources needed to gather primary medical and chemical information on contaminants, and they believe the Federal Government has a primary responsibility in this area.

The sixth finding, based on our own analysis, is that the gap between the information States need and the information they are getting is substantial.

Lastly, our data are clear in showing that States do need more information to help them establish ground water standards.

Our recommendation is that EPA should be more active in this area and develop, in particular, a criteria document program specifically for ground water contaminants, with the greatest attention being focused on those contaminants that pose the greatest risks.

In conclusion, Mr. Chairman, we are concerned about the slow pace of activities focused on our ground water resources, and we raise the question of whether protection from contamination is currently adequate. We believe it is important to move ahead much more rapidly than we have been doing and that EPA is the natural focus for the work we propose in this area.

That concludes my remarks, Mr. Chairman. I would be happy to answer any questions you or the committee members may have.

Good morning, Chairman Baucus.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. Thank you. I apologize for arriving late.

I have a statement which, in the interest of time, I will place in the record.

[Senator Baucus' statement follows:]

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

I am pleased to welcome you to the third groundwater hearing which Senator Moynihan and I have scheduled this year, which is a joint effort of the Subcommittee on Water Resources, Transportation and Infrastructure—and the Subcommittee on Hazardous Wastes and Toxic Substances.

Our first two hearings featured witnesses from national organizations and industry who offered their suggestions on what should be included—and what shouldn't be included—in a federal groundwater statute.

Today we are concentrating on the states themselves. In order to construct a useful federal statute, it is critical that we understand where the states are succeeding, and where they may need assistance with their programs.

Because I am particularly interested in the state standard-setting process, I ordered two reports from the Government Accounting Office on state programs for groundwater protection, with particular attention to standards.

The result of GAO's efforts were two very thorough and useful reports which Ms. Eleanor Chelimsky will review for us today.

I do not wish to preempt Ms. Chelimsky's testimony, but allow me to emphasize a few of the GAO study's most interesting findings.

First, virtually every state has some sort of groundwater program—some have specific statutes, others regulate groundwater under a generic water or waste statute.

Forty-one of the 57 states and territories have set their own numeric or narrative standards for some contaminants, the median number regulated being 35, with New York regulating 160.

More than three-fourths of state officials queried said they had relied on EPA's standards developed under the Safe Drinking Water Act in setting groundwater standards. The major constraints faced by state officials were listed as:

Inadequate information from the federal government.

Inadequate number of support staff at state level.

Lack of technical expertise among state staff.

Eighty-two percent of the state officials asked said that EPA's issuing a new series of criteria documents on groundwater contaminants would be useful.

The GAO report concluded that "states' standard setting programs would benefit the most from one centralized reference source in the form of groundwater criteria documents for information on contaminants."

I would like to point out that criteria documents and a centralized clearinghouse for groundwater information are features of bills currently before this Committee, S. 20 and S. 1105.

Moreover, GAO stated, "We believe no other agency [other than EPA] has the technical ability and experience to develop the necessary information.

GAO went on to caution that despite the preference of EPA's Groundwater Office, it is not clear that EPA should use the same 83 substances identified in the Drinking Water Act for its groundwater contaminants research documents. This is a subject that I hope Ms. Chelimsky and others will comment upon.

Other witnesses today will concentrate on research in groundwater. Currently research activities are divided primarily among the U.S. Geological Survey, EPA, U.S. Department of Agriculture and private agencies.

National Water Research Institutes and Land Grand Colleges play an important role, too. One member of our second panel of experts will talk about the Research Institutes Program, funded under the Water Resources Research Act of 1984 which is under review by this Committee since it is set to expire September 30, 1989.

Others will discuss the role of the Cooperative Extension Service and research needs of rural areas.

We are especially honored this morning to have as witnesses Senator Bill Bradley and Congressman Sam Gejdenson, both of whom have taken an active role in developing groundwater legislation.

Senator Bradley has recently introduced S. 2108—which requires the Bureau of Reclamation to evaluate the impact of its projects on groundwater. Congressman Gejdenson was a primary sponsor of H.R. 791, which the House has passed and sent to this Committee for consideration.

I thank you both for appearing before this committee today, and for your concern about our nation's groundwater.

Senator Lautenberg. Mr. Chairman, the testimony is of great detail and great interest. I asked Ms. Chelimsky to summarize her statement which she did. She has her colleagues from GAO with her.

Some of the information she presents is on the frightening or at least alarming side, suggesting that if we move at the same pace as we are presently doing, if I understood it correctly, to get the regulations underway that it could take 40 years. That is if we are still here.

Ms. Chelimsky. If we go at the same pace.

Senator Lautenberg. Yes.

Ms. Chelimsky. Well, in the long run, we are all dead, as Keynes said.

Senator Baucus. Thank you very much, Ms. Chelimsky.

Senator Lautenberg, do you have any questions at this point you want to ask of Ms. Chelimsky?

Senator Lautenberg. Not at this time, Mr. Chairman.

Senator Baucus. Your major point is what? What is the bottom line here?

Ms. Chelimsky. The major point is that information is terribly lacking. The States are proceeding, I think, admirably to move ahead as best they can, and they are doing it with very little help. What you have is an extraordinary amount of duplication of effort and simply a lack of technical expertise to be able to go ahead with numeric standards.

We feel that those standards are important to develop.

Senator Baucus. What do we do about it? I know you are not charged with that responsibility, but based upon your analysis and study, I am sure several points popped into your mind.

Ms. Chelimsky. Yes.

Senator Baucus. What might some of those be?

Ms. Chelimsky. Well, it seems to me that we definitely need to begin with more responsibility for EPA with regard to criteria documents. We think that would go a long way.

We also think that somebody needs to light a fire under this process. It is going very, very slowly. It seems to me that by the time we find out what we need to know about it, it may be too late to do anything about it, because, of course, there is nothing that says that as we get more knowledge, the problem itself won't get worse. Obviously, the two trends are not mutually exclusive.

So, it seems to me speed, some due speed, is necessary. I am not saying, "go rushing into it," but it is presently too slow.

Senator Baucus. It is a very complex problem, though, due to the nature of the beast. I am wondering, in addition to lighting a fire in the sense of greater accumulation of data, whether in addition to that there is a need, in your judgment, either through the Office of Technology Assessment or elsewhere to develop a methodology and/or some research into new technologies to make sure we are not wasting our time or less likely to be wasting our time, that is, that we are getting the kind of data and the kind of methodology that makes sense apart from just greater accumulation of whatever data is available.

Do you have any thoughts about that problem?

Ms. **Chelimsky**. Yes. I naturally go back to the work we did on water pollution earlier, surface water pollution. What we noted there was that there weren't very good measures for looking at what was happening.

You have something called "swimmability" and "fishability," and, you know, that is not my ideal of an operational definition. It is difficult to use them to learn anything about what is happening.

The first thing I would suggest is that we think very seriously about standards. That is the reason we were so interested in standards, because it is a way to measure. It is a way to set goals. It is a way to monitor, to know whether you are making progress, and it is a way to determine and evaluate whether any program that you put in is working or not.

So, the first thing I would suggest is that, in terms of methodology, I would look at sound measures by which you can determine whether something is getting worse or better. I think that would be the very first thing I would want to look at.

It is very difficult to do it. I am not suggesting that this is an easy process. But I also think that we need to move on that. It seems to me that 83 standards in 16 years, 22 of which had already been developed by the Public Health Service, is pretty slow.

Senator **Baucus**. Thank you very much.

Do any of the rest of you have any thoughts on that question?

Mr. **Kachura**. Mr. Chairman, although our original work was not focused on the legislation that this hearing is centered on, in reviewing that legislation, I believe that the emphasis is in the right direction.

What you are doing within the context of that legislation is pushing for research on the part of EPA to look at the health risk issues and other concerns related to ground water contaminants which is, as we highlighted in our report, vitally needed.

In a second area, work that you want the Geological Survey in the Department of Interior to proceed with, trying to understand the severity of the problem in terms of the actual contamination of the ground water resource is an extremely important concern that should be focused on and which our government should proceed with.

So, those are the additional comments that I would have. Thank you.

Senator **Baucus**. Here is your chance. This is your opportunity. Andy Warhol said what, 15 minutes and how many seconds?

Mr. **Litkowski**. I will make one comment, then, in connection with the development of standards. It seems as if the States feel that they have a logical role in the process, that is, there is information developed at the State and local level as to the nature of the problems they have to deal with.

Some of the legislation has talked about developing national registration programs for measuring the extent to which producers generate contaminants that might affect the ground water. The States in our survey felt that a lot of that kind of information was really more naturally placed at the local level, that they could develop that information.

They differentiated that from the kind of information and technical support they required from EPA. There was a clear research difference in terms of the types of information that they needed in supporting their efforts to set ground water standards.

Senator BAUCUS. Do you think the States can adequately generally develop more localized data and approach?

Mr. LITKOWSKI. That was the impression I got, particularly in the development of an understanding of what is going on in connection with well development or well closings. They had a much more intimate knowledge of the kinds of problems that were existing, and they needed some mechanism to deal with those problems. That is where they had their problem in finding information from the Federal Government.

Senator BAUCUS. Do you find a great sense of urgency among States compared with the Federal Government?

Mr. LITKOWSKI. Yes, definitely a much greater sense of urgency and also a great frustration in knowing what to do. We found that while we were conducting our survey of the States, many of the States that we were talking to were also conducting their own surveys of other States to find out what the other States were doing, because they were really completely in the dark in that respect

They had no good experience that they could draw upon in developing their own State programs, and there seemed to be an interest in developing these programs but without really the capability to do that without the information.

Senator BAUCUS. Thank you very much.

Ms. CHELIMSKY. If I could add something to that—you see, you gave us our chance and now you can't stop us. The thing that strikes you, though, is that it is very complex. The Federal-State role is complex, especially since, as Senator Bradley said earlier, the States have already gone so far in these areas.

But there is a peculiar interaction between the two things. For instance, there is an enormous variation across the States. Some of it has to do with the fact that some States have more technical capability than others.

But you are never sure what that variation really means, whether the decisions about which contaminants to look at, for example, really reflect a local need and a conscious desire to do that or whether they reflect very poor information in some cases and good information in other cases.

It is very hard, you know, to explain that variation simply in terms of different levels of technical knowledge.

Senator BAUCUS. Thank you very much.

Before you leave, Senator Durenberger, do you have any questions or comments?

Senator DURENBERGER. Mr. Chairman, thank you.

I really regret not being here earlier for our colleagues and for this testimony, but I was testifying in Appropriations on a bill that both of us cosponsored last year on rural hospitals, and I knew you would understand my absence.

I would like to compliment all of you on the study. I would also like to say that I agree, in general, with the conclusion that you have come to. However, I am troubled by one thing that looks like a conclusion in the study, and I hope it is just an assumption rather than a conclusion.

Your first few conclusions demonstrate what we have been finding in a lot of other environmental programs, and that is that using numerical ambient standards is a very slow means to get environmental protection. So, what is difficult for me to understand here is why you think we ought to keep going in that direction.

You know where I am coming from, because you have probably looked at the general approach that I have taken, and that is that I have recognized over all the time that Max and I have been at this business that you never seem to get there with the standards approach. So, I suggest in my legislation an entirely different approach, which is minimum technology requirements.

That is just one. You could probably come up with others, but one of them is to use technology requirements or at least minimum technology requirements as a way to try to achieve the same end.

So, I need to ask you whether your study goes right on by the question of whether the standards approach is the right foundation for ground water protection or not. Are you just making an assumption that that is the way we ought to go?

Ms. **Chelimsky**. No, no.

Senator **Durenberger**. Or are you saying that you have concluded that we ought to stick with standards and we shouldn't try a different approach?

Ms. **Chelimsky**. Well, I would never say that you shouldn't try a different approach. Obviously, we need to look at all approaches, and it is true that there are problems with standards, both narrative standards and numeric standards.

I think the thing that drove us, as I mentioned earlier, was the study that we did on water pollution earlier where we looked at the fact that there were few standards. The ones that were there, the measurements that we had were just very poor, and you could never get a statement about whether the water had improved that was really very satisfying or very rigorous. As I just mentioned before you came in, to measure whether swimability or fishability has improved—you know, it is in the eye of the beholder.

What you want to think about, it seems to me, in this is—let me just go back to the issue of how difficult standards are to develop. It seems to me that narrative standards are easier to develop, but they have the problem that it is very hard to enforce a standard that isn't really rigorous. So, there are some questions of equity. There are some questions of consistency, as well, that come up, even though they are easier to develop and States prefer them in many cases.

The numeric standards are costly and take a long time, but it seems to me they clearly can be developed. We know that from the development of the public health standards that we have for surface water that were all ready when EPA came in.

It seems to me that once you have them, you really have something. First of all, they are enforceable. You have something that is consistent, and you have something that is an admirable basis for monitoring. You can see whether a contamination level has gone up or whether it has gone down.

So, from the oversight point of view, it is not negligible the advantage you get. And it is looking at the results of the other program and the fact that we didn't try to do that that made us realize that the game is probably worth the candle.

Senator **Durenberger**. What are the best examples of a workable standards approach in this area?

Mr. **Litkowski**. If I might amplify on that and then draw back as well to your question about control technologies, in one State that we looked at, Wisconsin, they had developed a large set of numeric standards, at the same time integrating their standards process with the various permit controlling agencies throughout the remainder of their government.

These other agencies were charged with the responsibility for developing control technologies for trying to get the people who were under their responsibility for issuing permits so that they were trying to use the best technologies. They were interacting with the standards so that the control technologies had to be done in terms of the measures that were established by the standards so that they had something against which they could measure the progress that might be made.

Senator **Durenberger**. So, what, in your view, is wrong with that kind of an approach?

Ms. **Chelimsky**. Nothing, because the measures are there. That is perfect.

The issue is, how do you get good measures? You can get them through standards. You can get them in other ways. It is just that it is really quite complex to measure changes in water. There is the issue of where you take your measurement. It is very complicated. We understand that.

I think OTA said in its report that they didn't think we would ever get a good sense of how contaminated the ground water is because it would be so expensive to go and do it, but that doesn't mean that you don't want to have good measures by which you could.

Senator **Durenberger**. It seems to me that the problem we have in many cases with using only a control technology standard is that the costs go up for whomever is using the water and putting it back on the land. So, they would rather talk to you about; well, we have to have a standard. You are pushing us up too high, and all that sort of thing.

We heard a lot of that when we were doing the underground storage tank legislation. It went through, and now we are coming up with new technologies all of a sudden. It has always been one of my theories that there is a lot of creativity out there that will meet your needs in a technical sense if they know that is where they have to go.

However, if they get to wait forever until you are able to match the control performance with some theoretical standard, then you are never going to get there. That is why I tend to say if we can move our judgment about these things in the direction Wisconsin is moving—I mean, rarely do we look east from Minnesota for wisdom, but I think in this case and certainly in my case, I have done a lot of it, because Wisconsin for us in Minnesota has been a model.

So, I just wanted to hear you say in terms of your evaluation that you haven't come to the conclusion that we ought to stick with standards, that we can move in the direction of control technology, and what I hear you now saying is that some combination of that, perhaps like the Wisconsin model, you can feel comfortable with as well.

Ms. **Chelimsky**. Yes.

Mr. **Litkowski**. To add another point to that, I think Wisconsin felt that they needed the standards so that they could measure something against the progress that was being made among the other parts of the government. However, the frustration that Wisconsin felt was the difficulty of finding the information—which is really a central part of our study—to enable them to set those particular standards. They had to go all over the place to do that.

Essentially, you have a situation which is duplicated in all the other States. They have to find that information, and it is very difficult for them to do that. I think that is the central message of our survey.

Senator **Durenberger**. Thank you very much.

Mr. Chairman, thank you.

Senator **Baucus**. Thank you all very much. We appreciate your help here.

Our next panel includes the Honorable Thomas Jorling, Commissioner of the New York State Department of Environmental Conservation; and Dr. Raymond Avendt on behalf of the Water Pollution Control Federation.

Mr. Jorling, we are honored to have you here. You may proceed in any manner you wish.

STATEMENT OF HON. THOMAS JORLING, COMMISSIONER, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Mr. **Jorling**. Thank you, Mr. Chairman.

Before I start with the testimony on ground water issues, I must compliment you and the members of the committee for the work that you have been doing with respect to funding the construction grant program. In view of the requirements that States make a transition to State revolving funds, your continued support of that commitment that Congress made is helpful to us.

We are presently trying to convince our legislature to adopt the enabling legislation, so your support is very timely.

I would like to thank you, Chairman Baucus and members of the subcommittees, for the opportunity to communicate my thoughts regarding the management of ground water resources and ground water legislation pending before the committee.

New York was one of the first States in the Nation to recognize the critical importance of ground water as a drinking water source. New York established one of the most comprehensive sets of ambient ground water quality standards as long ago as 1978.

These ground water class "GA" standards, which are at least as stringent as the Department of Health's drinking water standards, are tied directly to effluent standards for discharges to ground water which are permitted under the State Pollutant Discharge Elimination System. These standards are also used to evaluate the impacts of waste disposal site leachate as well as other real and potential contamination sources.

Currently, all fresh ground waters in New York are assigned to class GA with best use defined as drinking water.

If I could interject at this point, in the discussion that Senator Durenberger was having with the representatives from GAO, New York State, and certainly I, subscribe to the thesis that you articulated. The crucial steps that we must take are technology oriented, prevention oriented, chemical-controlling, and technology forcing.

Those are the steps that must be taken over the whole range of activities that can result in release of contaminants to ground water. It is true that it is important to measure whether those programs are succeeding, but these measures should not be used as the control strategy.

We should not attempt to connect a given level of water quality in the ground with activities on the surface. There are simply too many variables between those two to have any assurance that we can protect that ground water. We must move to a technologically oriented, technology forcing program across that whole array of activities that can release substances to ground water.

I think, in contrast to the GAO articulation of the history of the Water Pollution Control Act, while standards exist to measure success, technology and forcing technology is the real instrument that has produced cleaner water, certainly in New York State.

New York was also one of the first States to develop a comprehensive ground water management strategy. Important elements of this strategy include a strong emphasis on problem prevention and a geographic targeting concept to focus special attention on the more critical recharge areas. This latter policy was adopted as part of the Federal wellhead protection program within the Safe Drinking Water Act.

New York's multi-faceted ground water program has included the establishment of a permit system for ground water discharges with specific effluent limitations; development of comprehensive bulk storage regulations for petroleum and, more recently, a wide array of chemicals; significant expansion of our spill response program; a strong emphasis on resource assessment, mapping and data management; and local government education.

I will summarize some of the following comments which basically go to the proper role of the Federal Government.

I think we share the general thrust that the Federal Government has a duty to do the kind of research that is necessary to evaluate chemicals, to evaluate activities that release chemicals that have no real geographic barriers, and to do so in a cost effective way in its laboratory structure and then make that information available to the States.

I would also add that another obligation of the Federal Government is to examine the chemical character of problematic materials in our economy. For instance, lead is frequently used in certain printing inks. That lead becomes a source of contamination when it is put in a land fill or when it is incinerated and is incorporated in the ash resulting from incineration.

There are substitutes for the use of lead in printing inks, and EPA has sufficient authority under TSCA to regulate lead out of printing inks in lieu of such substitutes. New York is presently preparing a petition to EPA to do just that kind of regulatory activity which we think is a very cost effective way of proceeding.

New York State does not see the need to develop new Federal programs to regulate sources not already covered by Federal law. We do, however, see a need for full implementation and full funding of programs already authorized.

Other Federal programs should be improved. For instance, the Federal control of pesticides should place much greater emphasis on appropriate controls of pesticides with significant potential for contaminating ground water. Because certain pesticides may be more problematic in different environmental conditions, (in cooler more humid conditions, for example.) States must be permitted to place more restrictive controls to protect their ground water resources.

In summary, New York State supports the overall Federal initiatives represented in the bills pending before you. The strongest need is for expanded Federal research, development, and demonstration projects with direct utility to ground water protection and regulatory programs developed and operated by the States. States must continue to have the primary responsibility for source regulation, determining final water quality standards, and designing water quality monitoring programs.

There is a significant need for funding Federal research and technology transfer activities and State activities in wellhead protection, sole source aquifer demonstration projects, non-point source management, and, in our case, a specific provision in Federal law dealing with the Long Island Aquifer.

We also support the establishment of minimum Federal technology standards at least as stringent as those in New York. Regulatory technology-based consistency throughout the country is necessary so that those States which vigorously regulate against ground water contamination are not competitively disadvantaged by industries relocating to States with less stringent programs.

I have provided more detailed answers to the set of questions posed by the committee in the attachment, and I will be happy to answer questions that you may have.

Thank you.

Senator BAUCUS. Thank you, Mr. Jorling.

Mr. Avendt?

STATEMENT OF RAYMOND AVENDT, WATER POLLUTION CONTROL FEDERATION

Mr. AVENDT. Thank you, Mr. Chairman.

As a preface, I would like to note that the Water Pollution Control Federation serves as a forum for discussion concerning the ground water policy issues. To that end as our most recent issue in May, we have outlined Senator Durenberger's comments on ground water protection.

Good morning, members of the Hazardous Wastes and Water Resources Subcommittees. I am Ray Avendt, president of an environmental group of engineers and scientists located in Annapolis, Maryland. We provide ground water management and hazardous waste site remediation services.

I would like to thank Senators Moynihan and Baucus for scheduling this third hearing and allowing me the opportunity to represent the 33,000 members of the Water Pollution Control Federation.

The WPCF is a multi-disciplinary society of professionals dedicated to enhancing and preserving water quality. Its members include municipal officials, engineers, scientists, manufacturers, and operating personnel involved with the protection, utilization, and treatment of water resources, including ground water.

I am especially pleased to be here today, because my entire professional career has been involved with the management and cleanup of ground water supplies. My experience includes management of ground water recharge demonstration programs on Long Island, investigations of New York City ground water infiltration galleries, and technical oversight of numerous Superfund cleanups in New Jersey, California, and New York.

These experiences have allowed me to witness first hand the problems of ground water remediation. Rather than list specific experiences, I would like to explain the steps of a ground water remediation project and describe the technical, scientific, and bureaucratic problems that I have encountered.

In the event of contamination of an aquifer, my firm might be hired to identify the contaminant's source, to stop the contamination, and to clean up the aquifer so it may be used again as a drinking water supply.

To do these things, we first would need to find the fingerprint of the contaminant. Locating the suspect sources is a project that takes, on the average, three to four months. Fingerprinting consists of tapping into existing data bases, developing a sampling protocol, conducting sampling over a period of time, and analyzing the flows to and within that aquifer.

The USGS is the first agency that we would contact to determine the aquifer's geological identity. Unless the aquifer is a major one, however, the USGS may not have this information. We would then turn to local public health officers who may have some geological records because of their involvement with that local drinking water supply.

At the same time that we are addressing the hydrogeological questions, we would contact the regional Environmental Protection Agency office and the State environmental agencies to obtain information about local hazardous waste activities with specific interest on treatment, storage, and disposal activities. In the event that we suspect an agricultural chemical contamination, we would also contact the county's agricultural extension agent, the USDA, or State college to learn about local farming practices.

Because there is no centralized data base, this scavenger hunt for information is frustratingly lengthy and cannot be tolerated when public health is at risk.

Furthermore, the data that does exist is incomplete. For example, in the case of agricultural fertilizers and pesticides, we may be able to get a source of information on the application rates, but this date is not enough for us to go ahead and protect the drinking water supplies. We need basic research to tell us what happens to various synthetic organic chemicals and nutrients in the soil. We also need applied research on the transport and transformation phenomena associated with metals, solvents, and volatile organics. And we need research on the migration of contaminants from sediments, unregulated waste streams, and storm waters.

Once we have identified the contaminant source, our immediate goal is to contain the migration of the contaminants. As with the identification process, the containment process is lengthy and can take just as long as fingerprinting.

This process consists of characterizing the plume which means extensive soil borings and well testings, and then in some cases literally cementing a wall around the contamination so that the plume is trapped.

The migration containment technology is well established but extremely costly. Therefore, we would recommend an increased emphasis on demonstration projects to identify fast-track implementation methods of migration containment.

In numerous ground water remediation projects, we are not able to determine the contaminant point source, or we discover that the migration is too extensive to permit implementation of a cost effective containment procedure. In those cases, drinking water officials must look to an alternative drinking water supply. Assigning costs for that new supply is difficult in most cases, because the responsible parties for the contamination cannot be found.

If we are able to identify the source and contain the migration, the final step is to clean up the contaminated aquifer. Our major problem at this stage is to enter into the debate on how clean is clean.

In some instances, we are not even talking about the purity of the water. For example, there are no standards for trace metals or organics detected in soils that are above an aquifer that is used for drinking water. Time and money are wasted at cleanup sites because we don't have enough information about applicable, relevant, or appropriate standards.

Ground water remediation is further complicated by the lack of trained and experienced personnel. As a former professor and current employer, I am alarmed at the shortage of qualified individuals necessary for these multi-disciplinary efforts. We need graduates who not only understand ground water problems but who have practical, hands-on experience in designing solutions.

I would recommend that emphasis be placed on applied, cooperative education. Conversely, experienced technical personnel without advanced degrees should be afforded the opportunity of professional certification.

It is not possible to continue to rely on prudent engineering practice to prevent contamination when we have a lack of qualified personnel to design, operate, and manage potential sources of contamination such as landfills, storage, and treatment facilities. If these potential pollution sources are designed well initially, then remediation will be unnecessary in many cases. Prevention makes economic as well as environmental sense.

All of the items I have mentioned—the lack of intra- and intergovernmental coordination, a lack of fundamental applied research, a shortage of multi-disciplinary personnel and a lack of standards—are not new problems associated with ground water remediation.

As legislators, you are well aware of the current maze of statutes designed, at least partially, to protect ground water. Ground water protection programs are in place but are fragmented.

What is needed now is coordination of existing programs and increased emphasis on research of contaminant behavior, health effects data, demonstration projects, information sharing, technology transfer, and training. Prevention activities as well as remediation activities would benefit from improvements in these areas. Both the House-passed bill, H.R. 791, and S. 1105 provide for most, if not all, of these activities.

The proper Federal role at this time, then, is to serve as the central focal point and a clearinghouse for these activities.

Thank you again for allowing me to testify today. I would be pleased to answer any questions you may have.

Senator BAUCUS. Thank you both very much.

I would like to ask you both several questions. First, given the present state of legislation, what do you most want this Congress to do? The second question is, what do you most fear or what do you not want this Congress to pass?

Two very broad questions: what do you want most, and what do you like least?

Mr. JORLING. Speaking from the perspective of the commissioner of a State program, what we would most like from Congress in this area is what we are also asking from Congress in the area of the Clean Air Act, and that is to compel leadership from EPA in areas where that leadership is crucial to State performance. That includes funding, technology oriented research, and health risk research in this area.

For instance, in the State of New York, we are presently engaged in promulgating a comprehensive set of regulations regarding the management of solid waste, including standards for landfills and waste-to-energy plants. We do not have at our disposal a Durham lab or a Cincinnati lab or a Corvallis lab. Yet, we have had to make very technical judgments without the kind of leadership that EPA should have at its disposal.

We have to promulgate these regulations if we are to achieve the desirable level of groundwater protection. So, I think the strongest thing that I would urge Congress to do is to put some fire in the belly of EPA.

Senator BAUCUS. To provide technological assistance.

Mr. JORLING. Technological assistance and the kind of performance that it should be getting out of its research.

Senator BAUCUS. And what do you most fear?

Mr. JORLING. Speaking again from the perspective of a commissioner, I most fear the imposition of what I will refer to pejoratively—because I also spent a lot of my life as an academician—as a pure or perfect regulatory regime for ground water management that would require us to spend all our energies and resources to establish a variety of measurements and quality standards across the wide array of New York State prior to setting any kind of conditions on people who engage in activities that can contaminate water.

What I hope we have is a more focused program which directs our attention and the attention on the Federal Government to controlling those activities which can contaminate ground waters.

Senator BAUCUS. I understand. Given the present budget and given the present Federal budget deficit, in your judgment, can EPA perform the assistance that you would like without any increase in Federal funds?

Mr. JORLING. I think it is very difficult to see EPA performing without an increase in Federal funds.

Senator BAUCUS. The question is then, why can't the States which have surpluses, in many cases, provide the additional funds for their own State technological assistance development? After all, they are closer to the problem.

Take Long Island, for example. That is an aquifer that doesn't flow into other States. That is a unique New York problem. Why can't New York, then—just playing devil's advocate for a moment—develop the resources without asking Uncle Sam to——

Mr. JORLING. I am asking for resources only in the very focused areas that I have suggested. In New York State, we have adopted a $1.2 billion hazardous waste site remediation program. In the fiscal year 1989 budget, I received 89 new people in the area of solid waste management out of the State general fund.

So, we have contributed to the solution of our problem. I am not asking the Feds to contribute to the solution of our problem. I am asking for the Feds to do the work that make each State's and all of the States 'work more feasible.

Federalism is anticipated in all of the environmental control statutes, namely, to do the work across chemicals, across technologies, across activities that, when performed, can be shared with the States for application to their unique circumstances. That is what we are asking for.

I get somewhat frustrated at this, and I am tempted to suggest that what I would like best, then, is just to have the responsibility for operating the Durham lab and the Cincinnati lab transferred to a consortium of States, and we will get a lot of product out of it.

Senator BAUCUS. And then the States will fund it? The States will fund the lab?

Mr. JORLING. I don't think we could bear the burden of that, but we could be very cost effective in getting work out. I——

Senator BAUCUS. Well, if the States control it, the States are going to have to pay for it.

Mr. JORLING. If that were the condition, with a small amount of transitional funding, I think we would be prepared to do that. But the point is that lesson after lesson has been learned that preventive measures are cost effective.

Senator BAUCUS. I am not quarreling with that. I get some sense that you want Uncle Sam to provide the assistance, but you don't want Uncle Sam to direct the regulatory framework.

Mr. JORLING. I would be happy, Mr. Chairman, to supply documentation of New York State's financial contribution to payment in these areas, and I will hold it up against any State in the Union, certainly against the performance of the Federal Government.

Senator **Baucus**. Well, that is not to say that answers the question, because compared to other States, you may be correct. That still may not sufficiently answer the question.

Dr. Avendt?

Mr. **Avendt**. I am at the other end of the spectrum. I am the pragmatic engineer who has been retained to either evaluate or clean up the aquifer.

Our concerns at the Federal level are that the Federal agencies make available the data that they have. We are spending a lot of time researching the researchers rather than researching the data. The data that the USGS and the EPA and the other agencies have needs to be coordinated and needs to be combined so that we can have access to it.

What I really don't want to see is an over-emphasis on regulatory standards being set because, one, they are time consuming and they don't address the immediate concerns we have for point source control or for remediation.

With regard to the Long Island question, I was involved in the major ground water management programs on Long Island and heavy Federal involvement and research into protection of the ground water aquifers. That data has been used in Florida, California, and in the Midwest to protect their sole source aquifers. So, that data was exchanged.

Senator **Baucus**. Thank you very much. I don't want to take too much time here.

Senator Durenberger?

Senator **Durenberger**. I yield to my colleague for questions.

Senator **Chafee**. Thank you. I want to thank Senator Durenberger for letting me go ahead of him, because I have another appointment.

I would like to ask one quick question, particularly of Mr. Jorling who is familiar with these areas. Do you think that we are getting a cost efficiency result from spraying $100,000 a year among 54 water research institutes?

Mr. **Jorling**. It's important to note that New York State is operating in the black, not with a surplus but in the black. We still have a stringent budget circumstance, but certainly the Federal Government does, too. I think that in times of budget stringency we should be very careful and target limited resources. Just spreading out money in these areas, I think, is misguided.

It takes a critical mass of resources to accomplish any of the complicated objectives. Simply to drill holes in the ground now could consume $100,000 on one project.

So, we need to be much more focused than simply spreading it out—I think your words were spraying it out—over a number of institutes.

Senator **Chafee**. Well, if you were king, you would not do that?

Mr. **Jorling**. No, I would not.

Senator **Chafee**. All right, thank you very much, Mr. Chairman.

Senator **Durenberger**. Mr. Jorling, New York is known for setting a lot of standards, 160, I think, was the last number. Can you tell us briefly how you use the standards? Is it just for cleanup or is it also for prevention?

Mr. **Jorling**. The standards, basically, are used to measure performance so that if, for instance, we have a remediation activity under way, our standards then become a device to guide the remedial investigation feasibility study performance of the consultants so that we can make cost effective judgments as to how and what remedial steps to take. That is one example.

Standards also become a sort of advance warning of whether activities are releasing chemicals to ground water and are causing a threat. They also guide us in our assessment of what chemicals are likely to be released in New York and if we make that judgment, then we can determine whether or not these chemicals are entering ground water, surface water, or soils.

Basically, standards are the devices we use to measure the success of programs. They are not the determiner of how much control we apply. Again, it is the use of best technology to prevent the release of those materials that guides our basic regulatory structure.

Senator **Durenberger**. One of the things you indicated in your testimony is that we don't need more Federal control technology requirements for source categories not currently regulated at the Federal level, and I want to ask you some questions about giving me a little definition of that statement.

What sources out there are not appropriately addressed by Federal programs now? How about septic tanks?

Mr. **Jorling**. Septic tanks are certainly not regulated at the Federal level, but we don't think it necessary to have a Federal program to regulate septic. The areas that I would point to are very similar to the areas in surface water protection, such as agricultural practices, especially the application of chemicals, and other nonpoint sources.

Senator **Durenberger**. How about the class IV injection wells or the injection wells area?

Mr. **Jorling**. Again, I am speaking from the limited perspective of New York State, but I don't think a Federal program is necessary there.

Senator **Durenberger**. Mining?

Mr. **Jorling**. Given the Surface Mine Act, the Federal act, and the way it has been implemented in New York State in conjunction with our own law, I don't think it is necessary to impose additional mining controls in New York State. Now, there may be some solution mining activities in other States, underground solution mining especially, that might require additional attention, but in our case, no.

Senator **Durenberger**. Fertilizer application?

Mr. **Jorling**. That is one of the areas. The application of chemicals onto the landscape is an area where we need help, but I think the help that we need most is in the assessment of those chemicals at the Federal level. In the case of pesticides, we need drastic improvements in the registration process by EPA.

Senator **Durenberger**. I have a few other questions I would like you to respond to, but we don't have a lot of time.

What do you think of the EPA classification system they are putting out under their ground water protection strategy?

Mr. **Jorling**. Well, we have evaluated it against our own classification system and find it basically compatible, depending upon how much administrative exchange of paper would go on between us and the EPA, but we think it would be compatible.

Our concern is that a new Federal program always produces an outpouring of paper between State and Federal governments and, often, that paper exchange produces very little in the way of controls. It seems to be a contest between two bureaucracies as to who can refine narrative description to the finest tune, and I think in some cases, that can be diversionary.

So, I hope at least on a technical side that it is consistent with what we have in New York State so we don't find it causing an erosion of our control program, but it could lead to an erosion of scarce resources of our agency.

Senator DURENBERGER. Looked at, though, in terms of a long-term national strategy for protecting aquifers, the notion that somehow today we can put aquifers into certain classes based upon what we know today—are you really comfortable with that?

Mr. JORLING. No, because all of our waters are graded in a single class and that is the drinking water class. The idea that we can disaggregate the ground water system into precise units where certain levels of contamination are allowed is a notion that, I think, is fundamentally flawed.

Senator DURENBERGER. One last question. You may not know this, but when we did the wellhead protection program in the Safe Drinking Water Act, we did it off your New York State legislation. We are not moving it very quickly at the Federal level, as I think you may already have indicated.

How is wellhead protection doing in New York State right now?

Mr. JORLING. It is becoming accepted. As it becomes accepted, it becomes a much more routine part of planning and development activities. So, I think it is working.

There have been, obviously, struggles in given situations about the degree of control necessary to provide the wellhead protection, but it, like almost all of the environmental programs that we have experienced, goes through a period of struggle and then becomes accepted and becomes an organic part of everyday life. I think that is where it is moving in New York State.

Senator DURENBERGER. Okay, thank you.

Thank you very much, Mr. Chairman.

Senator BAUCUS. In one minute, because we are going to have to go, why Federal regulation of agricultural non-point source fertilizers but not septic tanks?

Mr. JORLING. Well, I think we need to clarify a little bit about what I mean by the Federal role. The Federal role in regulating agricultural chemicals is best directed to registering pesticides. I am not talking about fertilizers for the moment.

Because of the nature of those chemicals and the inability of 50 States to explore all of the variables associated with those chemicals, their toxicity and the like, it is best done at the Federal level. At the Federal level, the EPA can evaluate how quickly those chemicals degrade, at what rates they degrade, and what their pathways are in ground water. All of those things can be done most cost effectively at the Federal level.

We don't have that kind of a situation with septic systems. I think, certainly, a State as in our case in New York is going to regulate the design, location, and character of septic systems to protect its ground water much more effectively than can the Federal Government.

Senator **Baucus**. Thank you very much. I want to thank this panel very much.

We have a vote going on, and we will temporarily recess, and the next panel will resume in about 5 or 10 minutes.

Senator **Burdick** [presiding]. Senator Baucus has asked us to resume the hearing. So our next panel will be Dr. Patrick Brezonik, director of the Water Research Center at the University of Minnesota; Dr. Gerald Groenewold, director of the Energy and Mineral Research Center at the University of North Dakota; and Dr. Roy Rauschkolb, director of the Cooperative Extension Services at the University of Arizona.

Gentlemen, we welcome you, and, Dr. Brezonik, you may proceed in any manner you wish. Your statement will be entered in the record in its entirety, so you may summarize if you would like to do so.

STATEMENT OF PATRICK BREZONIK, DIRECTOR, WATER RESEARCH CENTER, UNIVERSITY OF MINNESOTA

Mr. **Brezonik**. Thank you, Mr. Chairman.

I am pleased to have this opportunity to appear before this subcommittee and speak on research needs on ground water.

I am Patrick Brezonik, director of the Minnesota WRRC and Chair of the National Association of Water Institute Directors, NAWID. My testimony today is on behalf of NAWID and the National Association of State Universities and Land Grant Colleges, NASULGC.

I would like to make four brief points and then quickly describe to you some of the ground water activities of the existing Water Resources Research Institutes.

First, my fellow directors and I agree wholeheartedly with the objectives of the proposed legislation. There is a clear need for, (a), a comprehensive program of research and development on problems of ground water contamination and availability; (b), expanded training of professionals to deal with these issues; and, (c), improved information transfer so that the information generated by researchers can be put to good use by planners and managers.

Second, the problems of ground water contamination are complicated and technically difficult. There are no simple answers. A well planned research program on these problems must allow adequate time. Instant answers are not feasible, no matter how much money is available.

We are concerned that the two-year time frame for research studies described in section 104 of S. 1105 will lead to poor quality research. We suggest that a ten-year program with interim milestones, much like that of the National Acid Precipitation Assessment Program, be adopted.

Third, regarding the proposed ground water research institutes, we believe that the specified number, 4 or 5, is too few to adequately represent the diversity of ground water problems in the country and also too small to take advantage of a significant fraction of the ground water talent in our major research institutes.

Along these same lines, we believe the criteria for selecting locations of the institutes should be broadened beyond the current criterion of regional geology to include climate and dominant land use patterns. Both of these factors greatly influence the transport of water and chemicals into ground water and thus influence the nature of ground water problems regionally.

The institute directors believe that at least six or eight institutes should be established around the country based on these criteria.

Fourth and perhaps most important, the Water Institute Directors are in favor of increased funding for a focused, academically-based research program on ground water problems. However, we are concerned that Congress not duplicate existing programs and capabilities in an effort to address these problems.

Therefore, we recommend that the authorizing language be modified to recognize the existing network of water resources research institutes as the logical academic home for focused programs of research, training, and information transfer on ground water issues.

I want to emphasize that in making this recommendation, we are not seeking uniform distribution of the new research funds among the 54 existing institutes, nor do we suggest that all 54 would necessarily participate as members of consortia in forming the 6 or 8 ground water institutes. The present water institutes are well situated to expand their programs on ground water if Congress passes additional funds.

Competition to establish enhanced focused ground water programs among the selected institutes or groups of institutes can be accommodated under our existing authorization or under the new revised authorization for the program which Congress will be considering soon.

I believe the committee is familiar with the nature of the water institute program and our broad mandate to conduct and coordinate water resources research within each State. I know that our directors have been active in informing Congress of their activities.

My written testimony summarizes some of the many accomplishments and activities of the program over its 24 years of existence. I would like to spend just a minute or two describing some of the institute activities in the ground water area.

Table 1 of my written testimony summarizes the research projects currently funded by the water institutes on seven major aspects of ground water issues. Seventeen of the on-going studies deal with ground water movement and transport models. Twenty-two studies are focused on sources and fates of pollutants. Five deal with pollutant effects on ground water use, and ten deal with control of ground water quality.

Over 70 projects related to ground water are underway in our institute research program at present, and the total funding for these projects, including State support, amounts to over $2.8 million.

We do not contend that this is enough. Most of the projects are quite small and could profit from enhanced funding. However, my point is that we clearly have an on-going program of ground water research, and we have a commitment to do whatever we can to help solve these problems.

The individual projects are listed by State in Appendix 1 of my written testimony. This list was generated by a computer according to key words, and I know that it is not complete. I know there are more than 70 projects. There is at least one project, for example, from Minnesota that is not on this list. It may interest you that there are four projects from North Dakota currently being funded by the North Dakota Water Resources Institute that deal with ground water problems.

Aside from supporting ground water research, the institutes are active in working with State agencies in preparing ground water research and management strategies and setting up data bases for State agencies and in holding conferences and workshops on ground water problems. For example, our Minnesota center cosponsored a workshop on nitrate contamination of ground water last fall, and we sponsored a State water resources conference in February at which ground water issues were featured prominently. Senator Durenberger from this committee was a featured speaker on ground water quality legislation.

In summary, the water institute programs are actively pursuing solutions to the nation's ground water problems. We are encouraged that Congress intends to call further on the nation's universities to expand their research and training programs on these issues.

The water institutes have the expertise, experience, and administrative capabilities to operate expanded ground water programs. We are ready to work with Congress and Federal agencies to move forward on these problems.

I would be happy to respond to questions.

Senator **Burdick**. Thank you very much.

Where are your offices on the campus?

Mr. **Brezonik**. They are on the St. Paul campus in the Bioscience Building.

Senator **Burdick**. What we used to call the farm campus?

Mr. **Brezonik**. That is what used to be called the farm campus, yes.

Senator **Burdick**. I am acquainted with the territory.

Mr. **Brezonik**. I know you are.

Senator **Burdick**. I am very pleased to be here to welcome and introduce Dr. Gerald Groenewold of the University of North Dakota. Dr. Groenewold is the director of the Energy and Mineral Research Center at the University and has an extensive background in ground water research issues.

I know that Dr. Groenewold shares my concern for expanding and strengthening research on ground water resources. I am a sponsor of the Ground water Research Act, S. 1105, which is among the several ground water bills we are considering in this hearing. The legislation would expand ground water research activities at both the Environmental Protection Agency and the U.S. Geological Survey.

A key provision of the bill would authorize a series of ground water research centers to identify and address ground water issues within a particular region of the country.

I know Dr. Groenewold will give us a good summary of the research issues facing the northern Great Plains States. I look forward to hearing from him and our other witnesses.

Finally, Mr. Chairman, I ask that the statement of Governor George Sinner of North Dakota and a letter from the North Dakota Department of Health be included in the record at this point.

[The materials referred to follow:]

STATEMENT

George A. Sinner
Governor of North Dakota

before

The Senate Subcommittee on Water Resources,
Transportation, and Intrastructure of the
Committee on Environment and Public Works

May 17, 1988

Mr. Chairman:

I would like to thank Senator Quentin Burdick for his introduction of S. 1105, which would authorize a national program of groundwater research, and for his leadership in recognizing the importance of groundwater protection, both nationally and regionally. In addition, I would like to commend Senator Burdick for recognizing the need for regionally-focused groundwater research, which is the only effective method of conducting groundwater research due to the dramatic hydrogeological differences which characterize the various regions of this country.

I am submitting this statement on behalf of the State of North Dakota in support of the need to establish regionally-focused groundwater research. I also want to provide some insight to your subcommittee regarding groundwater issues and concerns in North Dakota.

The issue of deliberate, thoughtful, and informed management of groundwater has become extremely important in North Dakota. More than 60 percent of North Dakota's residents depend upon groundwater for their domestic supply. More than 95 percent of North Dakota's rural residents depend upon groundwater as their primary source of water. Key groundwater issues in North Dakota include, but are not limited to, groundwater resource characterization and evaluation, siting and design of municipal and industrial waste management facilities, impacts of agriculture on groundwater, and identification and remediation of existing groundwater contamination.

My administration is committed to preserving and safeguarding North Dakota's groundwater resources. The North Dakota State Department of Health and North Dakota State Water Commission, the lead state regulatory agencies responsible for groundwater protection, are working aggressively to implement responsible groundwater protection programs. The State Department of Health is currently finalizing the North Dakota Groundwater Protection Strategy.

At this time, a critical need exists in North Dakota and throughout our region for focused groundwater research. Proper regulation of groundwater requires, first, an understanding of the resource and associated key issues. The Energy and Mineral Research Center at the University of North Dakota, the North Dakota Water Resources Institute and the Experiment Station at NDSU all have extensive and long-term groundwater research programs. Those programs, which also draw on the expertise of researchers at other regional universities, have made North Dakota a regional leader in a wide variety of groundwater research topics. In addition, these various entities have a long tradition of working closely together with the regulatory agencies.

Fundamental information regarding groundwater occurrence, quality, and protection is critical to appropriate management of groundwater in North Dakota. Because of variability in groundwater conditions between regions of the United States, it is essential that groundwater research be regionally-based and focused.

Senate Bill 1105 calls, in part, for regionally-focused groundwater research coordinated through university-based, as well as other broad based, regional groundwater research institutes. I strongly support this concept and want to emphasize that North Dakota's ability to be a leader in such a regional research effort is well documented.

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NORTH DAKOTA CENTENNIAL

NORTH DAKOTA
STATE DEPARTMENT OF HEALTH
AND CONSOLIDATED LABORATORIES
State Capitol
Bismarck, North Dakota 58505

ENVIRONMENTAL HEALTH SECTION

1200 Missouri Avenue
P.O. Box 5520
Bismarck, North Dakota 58502-5520

May 13, 1988

Senator Daniel Patrick Moynihan
Chairman
Subcommitte on Water Resources
Transportation and Infrastructure
Committee on Environment and Public Works
United States Senate
Washington, DC 20510-6175

Dear Senator Moynihan:

It has come to our attention that your subcommittee will be holding a hearing on May 17, 1988, to receive testimony on Senate Bills S. 20, the Groundwater Protection Act of 1987, S. 1105, a groundwater research amendment to S. 20, and H.R. 791, a groundwater research bill that passed the House last year. Since we will be unable to attend this hearing, we would like to take this opportunity to provide the subcommittee with some comments on groundwater research which apparently will be the focus of this hearing.

The State Department of Health and Consolidated Laboratories is the regulatory agency in North Dakota responsible for the protection of the quality of all of the waters of this state. We take our environmental responsibilities very seriously especially as they relate to the groundwater. This section of the country does not receive an abundance of rainfall and, consequently, we are very dependent upon a finite groundwater resource as a source of drinking water and for other beneficial uses.

We appreciate the recognition and concern which Congress has demonstrated through the passage of various pieces of legislation designed to protect the groundwater or to clean up past decades of contamination. You have given us regulatory tools to respond to real problems which need immediate attention and have set in place a mechanism to prevent similar occurrences.

If "we" (the regulatory agencies and Congress) had the luxury of time to respond to these needs "we" would have studied, researched, and found cost-effective solutions to these problems. Research and study was not a high priority, "we" needed results and "we" needed them now. While there are examples of success in both prevention and/or remediation of groundwater problems, we are finding more problems than there are

Environmental Enforcement Environmental Engineering Waste Management & Special Studies Water Supply &

the resources to properly manage our groundwater resources for the future.

"We" must continue our efforts as best "we" can to prevent or solve problems but at the same time put more emphasis on basic and applied research to assist and provide a firmer foundation for more informed decision making. The problems, real or potential, confronting groundwater protection are becoming increasingly more complex from a technological standpoint.

Since groundwater geohydrology varies across the nation, regionalization of research centers across the United States should be seriously considered. This approach would provide a focus within a region on longer range technological strategies and solutions and build upon what has been learned from the relatively short-term efforts which have been applied to date. The regional research centers could be networked to provide a national pooling of information to aid Congress in directing where governmental resources must be directed in the prospective sense.

This department supports the need for increased groundwater research and increased accessibility to research information, data, and reports. We would hope that the legislation you have before your subcommittee will address this need. If you desire additional information from us, please do not hesitate to contact us.

Sincerely,

Gene A. Christianson

Gene A. Christianson, Chief
Environmental Health Section

GAC:mjm

Senator **Burdick**. We welcome you, Dr. Groenewold, and you many proceed.

STATEMENT OF GERALD GROENEWOLD, DIRECTOR, ENERGY AND MINERAL RESEARCH CENTER, UNIVERSITY OF NORTH DAKOTA

Mr. **Groenewold**. Thank you, Senator.

I appreciate the opportunity to appear before this subcommittee and present this testimony. I am going to be restricting my comments to the ground water research provisions of S. 1105 and H.R. 791. Specifically, I would like to say some things about our impressions and feelings about the establishment of university-based regional ground water research institutes and, indeed, a regional focus for ground water.

I think, as you know, to date, there has really been no comprehensive environmental legislation enacted in this country which considers all the elements of the geosphere, hydrosphere, atmosphere, biosphere, and their interactions. Rather, there has been a progression of legislation designed to address specific elements and issues.

Ground water protection has been only peripherally addressed through implementation of statutes such as the Clean Water Act and the Safe Drinking Water Act. That has led, I think to some interesting problems and unfortunate problems.

I use as one example the Clean Air Act which requires, in many cases, that scrubber systems be put on stacks of utility facilities. Indeed, that has provided some measure of remediation, if you will, for air issues.

However, in turn, we have generated tremendous volumes of solid waste which were not considered in that original legislation. So, there has been a contradiction. At times, we have generated problems while trying to solve another problem.

I think we desperately need comprehensive legislation. Comprehensive ground water legislation as embodied in S. 20—and I think S. 20 is indeed a very fine bill—cannot be totally effective, however, until key research is completed. In essence, what we are saying is that meaningful and enforceable legislation simply must be based upon scientific and engineering principles.

I want to clarify that we are not suggesting that research should necessarily be done first and hold back the implementation of regulation. We need regulation of ground water, we need it desperately, and we need it immediately, but we need to do it intelligently and objectively.

The only way we are going to have in this country, I believe, reasonable and enforceable regulation of ground water, comprehensive enforcement of ground water, is through focused research. I strongly emphasize the need for focused research.

Secondly, I believe that research has to be interdisciplinary. I think we are suffering throughout this country from an awful lot of research which is specific to one discipline when, in reality, we need to consider a wide range of disciplines to address the complex issues of ground water.

Ground water is a very complex resource. It is a resource that is not well understood. To understand it, we need the expertise of not only geologist and geohydrologists and geochemists, but we need the expertise of soil scientists and agronomists and chemists and physicists, microbiologists, biologists. We need interdisciplinary approaches to address the key research issues.

I think once that type of approach is taken, we can fill in the gaps, if you will, in the regulatory structure. I think the regulatory structure needs to be put in place. It will have gaps in it. It needs to be flexible so that we can fill in as research results are made available.

There are dramatic regional differences across this country with respect to ground water. Ground water is really a reflection of a combination of climate and topography and the three dimensional geologic framework. Therefore, there is, in many cases, regional consistency. Yet, between regions, there is a great deal of variability. In some cases, we state specific characteristics. In other cases, it is specific to smaller areas.

However, certainly on the larger scale, we should not go beyond regionally focused research. I think that is extremely important.

I strongly support the provision for the establishment of university based regional ground water research institutes. I agree with my colleague to the left that four or five may not be enough. I suspect seven or eight may be a better number, but certainly any number would be a good start, and I sincerely appreciate that provision. I think it is awfully important.

I think it is important because it will bring to bear the regional expertise in the sense of faculty and other full-time researchers at universities, but it will also, at least as importantly, provide a mechanism for the training of ground water professionals.

I think we have a major problem facing us in this country—and we heard it in some earlier testimony—and that is very simply that there is a great deal of emphasis on ground water. There are a lot of people in this country selling themselves as ground water experts when, indeed, they are not.

We need properly trained people, and that certainly is an integral part of the proposed ground water research institutes.

I would like to say a little bit about the programs that we have at the University of North Dakota in ground water. These programs started about 20 years ago. They have received major emphasis in the last 14 years.

We are currently working on ground water study sites in seven States. We have over the last 14 years installed about 2,500 ground water monitoring wells throughout the northern Great Plains. We also have study sites in Texas, Illinois, and Ohio.

We have a major program which has grown from a very small start. It is very interdisciplinary in the sense that it not only includes expertise at the University of North Dakota, but it also incorporates the root zone hydrologist and the soil physicist from North Dakota State University. So, it is very much a combined effort.

We have also worked and are working currently with researchers at Montana State University, with the University of Wyoming.

We have also done extensive work with Southern Illinois University, Penn State, and West Virginia University.

So, we have taken what we feel is the appropriate approach to ground water research, that is, interdisciplinary and multi-disciplinary and cross-disciplinary research.

Some of the topics that we have been involved in include design of ground water monitoring systems, of course, ground water resource characterization and evaluation, and conceptual and numerical ground water modeling. And I would like to add one comment to that.

I hear a great deal of discussion about numerical modeling. I personally believe that it is over-emphasized. I think the state of the art in this country and in this world, indeed, to provide the input necessary to realistically model in detail ground water has simply not evolved to the point where we can feel comfortable with much of the modeling that is going on.

I say this—and it possibly sounds very caustic—but I think much of the modeling that is being done is, in essence, an excuse for not thinking and not working. I think we need to focus on real world field data. We need to work, we need to think, and we should not rely on a computer.

I think, ultimately, we will be able to develop realistic, detailed ground water models. I think it is a highly desirable objective, but I think they are anywhere from one to two decades off.

We have also been very involved in a number of projects focused on all aspects of waste disposal from sewage lagoons and landfills to hazardous waste refinery sites, mining wastes, et cetera—oil and gas drilling muds, brines, production waters.

We have done a great deal of work in the area of characterization of the toxic element attenuation capacity of disposal site sediments. That has been throughout our region and as far south as the Gulf Coast. We have five study sites in Texas.

We have also been involved in a very interesting project looking at utilizing cementitious wastes, the solid waste from power plants, mixing them with hazardous liquid wastes to generate non-hazardous mixes. That looks like a very promising technology for disposal of certain kinds of wastes.

We have an extensive program in waste water treatment. We have also developed within our own group some very specific methods for waste leaching characterization.

Finally, we are involved in a number of projects focused on remediation, particularly bio-remediation which we feel is one of the real technologies of the future.

From all this, of course, we have developed some tremendous data bases. Just one study alone generated 17,000 chemical analyses. So, we have a tremendous amount of information available which is regionally applicable.

The key ground water research issues that are facing the northern Great Plains, drawing from our research, certainly ground water resource management. We need to better understand the fundamentals of the current flow of chemistry, how we can utilize it, and how we can safeguard it for the future.

Impacts of agricultural chemicals—you have heard a lot about that. In an agricultural area such as we come from, we feel that is an extremely important issue. A recent survey of wells for the State Health Department indicated that pesticides are indeed present in some of the drinking water supplies, municipal water supplies, in North Dakota.

Citing of municipal and industrial waste management facilities—obviously, that is an important question. One of the specific areas where I think we need to focus on there is production waters from oil and gas drilling. We produce a tremendous amount of waste brine, if you will, from the oil and gas industry. Much of it is injected in injection wells, either actually for disposal or for enhanced recovery of oil. Those injection wells vary in their construction, the techniques used vary, and I think we have a major question facing us there.

I would also like to add that one of the things that I think deserves more attention with respect to the waste side of ground water is that many of our wastes probably should be considered as resources. In a sense, the best waste management plan is a marketing plan.

There are many wastes, particularly solid wastes, which have a potential economic value. I think we need more research focused on how we can utilize these things.

Soil salinity which goes back to farming practices is a key issue in our area and, certainly, again, ties together, requires a tie, of hydrogeology and the agricultural sciences.

Acidic deposition is a key issue. It is commonly assumed that because we have an alkaline landscape, acidic deposition will cause no major problems in our area. I don't believe that. The buffering capacity of those materials has a limit, and we don't know what that limit is.

There are a number of other issues. I think technology transfer and education is an extremely important aspect of all this. We hear it over and over. It is not being done in a coordinated way. We need coordination.

Finally, I would just like to say that we feel that S. 20 represents a comprehensive regulatory approach, but it cannot be truly effective unless it is guided, if you will, by focused research, and that is research as proposed in S. 1105. We really believe that S. 1105 is providing the type of research program necessary to guide a comprehensive ground water program in this country.

Finally, S. 1005 and H.R. 791 also call in part for the establishment of regionally focused ground water research institutes. We strongly support this concept. I want to emphasize North Dakota's capabilities as a leader in such a program.

I thank you. I appreciate the opportunity to speak to you on these matters today, and I would be happy to answer any questions you may have.

Senator **Burdick**. Thank you.

Dr. Rauschkolb.

STATEMENT OF ROY RAUSCHKOLB, DIRECTOR, COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF ARIZONA

Mr. **Rauschkolb**. Thank you, Mr. Chairman.

Senator Burdick, members of the committee, Chairman Baucus, my name is Roy Rauschkolb. I am director of Extension Services at the University of Arizona. I am also chairman of the Extension Committee on Organization and Policy which is a national policy committee under the National Association of State Universities and Land Grant Colleges.

You have some prepared remarks. I would like to deviate from those and speak about basically three things: one, what I think the land grant system which you have already vested in substantially can do relative to the research and education that is required to implement a ground water cleanup; secondly, talk about what I think is an important twist that exists with those organizations, those research extension programs in the various States; and, third, to give some examples of the kind of cooperation and the kind of programs that are going on in States now that would give you some indication of the fact that we are able, interested, and ready to take on a responsibility in dealing with water quality problems.

I have a couple of documents which I did not provide earlier. One is a report from the Extension Committee on Organization and Policy on Ground Water Education which was a report that was put out in 1985. The Agricultural Experiment Stations Committee on Organization and Policy appointed a Research Committee which has prepared a corollary report looking at it from the research perspective also published in 1985.

Interestingly enough, when one looks at the conclusions of those reports that were done independently, they come to the same conclusion about the kinds of programs that need to be implemented in research and education.

I would also like to re-echo the remarks of Senator Bradley when he pointed out that it was important for this kind of legislation that you are considering from the perspective of providing leadership in setting policy and establishing direction for dealing with water quality problems. This is clearly an issue that is on the national agenda, and I think it is timely that this kind of legislation be considered.

You have heard some remarks today, and I know from your own experience and knowledge that agriculture is being targeted as a major source of non-point source pollution. I would point out that that is not by choice, but it is by virtue of the fact that they control an expanse of land with a diversity of crops and cultural practices.

I might just quote from a farmer who lives in Arizona, Wilbur Wuertz. I think you know Mr. Wuertz, Senator Burdick. He has indicated that he has been working following what he thought were proper practices, and now he finds out, in his words, he is fouling his own nest. What he would like to have is some kind of guidance in how to alleviate that problem.

Agriculture also is a major user of water, particularly in States where irrigation is obligatory. In those States about 85 to 95 percent of the water is used by agriculture. So, that is another reason why we think the university land grant system which deals with agriculture and families and young people is a good place for expanding your support for dealing with water quality.

Water conservation and management, as we have heard already, are important mechanisms for improving water quality. In my opinion, however, the regulation in and of itself will not solve the problem.

When we are dealing with such vast expanses of land with that diversity of practices that I mentioned, it requires some technologies, best management practices, if you will, that can alleviate the problem. In order to implement these best management practices, we must aggressively seek to educate the users of these resources on how to solve or how to prevent putting on the chemicals that might eventually leach to the water table.

I think there is, as I indicated, a mechanism already in place through the land grant universities, and what I would hope is that you would consider in your legislation including the land grant universities through research and extension in the bills. None of the bills that I have seen so far that speak to research or education mention either the agricultural experiment stations or cooperative extension.

As a matter of fact, you are already investing in Federal dollars about $700 million in those institutions, and they are located in every State. It is where most of the expertise relative to water resources and agricultural practices resides.

The important twist that I referred to earlier goes like this. We have in cooperative extension just recently identified eight national initiatives, one of which is water quality, and part of that was based on the kinds of studies that we have done that showed that water quality was a major issue on the national agenda.

The agricultural research stations have also identified the same national initiative. The important twist is that these are issues of national importance, but we solve the problems dealing with how to alleviate or prevent ground water pollution at the local level. Nearly everybody that you would speak to, I think, knowledgeable about how the biological and physical systems operate would tell you that you have to consider site specificity in recommending any kind of practice to control ground water pollution.

So, we look at national issues, but we solve the problems at the local level where we have the expertise.

Senator **Baucus**. I am going to have to ask you to summarize, Dr. Rauschkolb.

Mr. **Rauschkolb**. Yes, sir.

Well, I would simply just go on to indicate a couple of examples. One is where we have been working closely with the farmer, we have saved him about 2 acre-feet per acre and changed his fertilizer practice as a result of the on-site field investigation.

We are collaborating with the Department of Environmental Quality within the State. In fact, we were involved with the State in drafting legislation which included representatives from the college on advisory committees, and we have established an ad hoc committee of consultants comprised of experts from the college and other USDA agencies to provide evaluation and recommendation on best management practices for the purpose of controlling water quality.

I would stop there, sir.

Senator **Baucus**. Thank you very much.

Mr. Chairman, do you have any questions?

Senator **Burdick**. Yes, I have one or two. This question is for Dr. Groenewold.

You are familiar with the various other research initiatives through your work at the university. Are there other research situations in the country which are analogous to the ground water research issue?

Mr. **Groenewold**. Yes, I think there are, Senator. I think in the sense of philosophy, an analogous situation we possibly could learn a great deal from would be SMCRA, the Surface Mining Control and Reclamation Act. I think, as you are aware, that was enacted in, I believe, 1977.

One of the problems with SMCRA has been that it provide blanket legislation for this country. It said this is how you are going to reclaim every surface mine in the country, in essence. There is very little flexibility. There was certainly very little realization that there were significant site specific or at least region specific variables.

Really, surface mine reclamation is an issue that is primarily hydrogeological, geochemical. I think there is a great deal that can be learned from that experience.

In recent years, more and more flexibility has been built into that specific program. Now, I think we are seeing a very beneficial end result.

So, there is a great deal that can be learned from SMCRA that is applicable to this. That is why I emphasize the need for comprehensive but regionally focused research.

Senator **Burdick**. You make a strong case for regional research on ground water issues as a compliment to research at the national level. Do you see a need for some sort of Federal level oversight of research conducted by regional research centers?

Mr. **Groenewold**. Well, certainly there has to be coordination of some sort. There has to be a lead. Every program, I believe, has to have a lead.

So, I would very much like to see—I assume it should be a Federal agency overseeing this entire program, coordinating, in essence acting as a research clearinghouse, if you will. I don't know the specific mechanism. I wouldn't recommend specifics how that might be done. There is certainly already some language there that suggests some possible ways of doing that.

Yes, indeed, I think there should be Federal oversight.

Senator **Burdick**. You have been involved in ground water research issues in the northern Great Plains States for many years. Considering the various issues you have raised in your testimony, what aspect of ground water research would you say is most important in the northern Great Plains States?

Mr. **Groenewold**. I think, in a general sense, a fundamental understanding and improvement of our fundamental knowledge of ground water flow of currents and chemical evolution is certainly critical. That is the building block, the basis for anything involving ground water.

On a more specific basis, I am very concerned about the impacts of agriculture on ground water. I am very concerned about production waters from oil and gas. I think those are two key issues that we need to address.

Senator **Burdick**. Thank you, Mr. Chairman.

Senator **Baucus**. Thank you, Mr. Chairman.

Senator Durenberger?

Senator **Durenberger**. Mr. Chairman, thank you.

I would like to reinforce a couple of things that I have heard here today. One is the recommendation that we think beyond a few new research centers. Mr. Brezonik made the recommendation, I understand, while I was out of the room, and he has made it to me before; and I think Mr. Groenewold probably reinforced it by saying there is a lot more to a university based research program than university based research.

It has everything to do with everything we have heard here in terms of who really is providing the leadership for ground water in this country. It isn't just the researchers. It is ag extension and it is the farmers out there and a whole lot of people.

So, the emphasis in limiting it, is sort of like limiting where you can do heart transplants, that you can't do them well unless you do them in only three or four places. However, a heart transplant gives you a new heart and maybe a little education with it as well, but university based research—I use university in the largest context—gives you so much more in a societal sense, including the training and the education and then the retraining and then the continuing education.

Where are you going to get continuing education? You are going to have to fly down to Arizona in the winter time and Grand Forks or someplace like that in the summer time or whatever the case may be.

So, I would really like, on the basis of our experiences—and I think the folks that are here at this table today will certainly recognize that. Mr. Brezonik at Minnesota has his little $100,000 Federal grant, but he isn't just doing ground water. He is doing a wide variety of these related projects, because that is the way we do them, and not just we at the University of Minnesota, but that is the way it is done all over with water in the larger context.

The second point that I would like to reinforce and maybe a couple of the other witnesses who didn't speak to it would speak to it, and that is Mr. Rauschkolb's comments about one of the defects in S. 1105. We can admit to it because we are the authors. He told us about it, and that is that right now, we have all the USDA research being done in the agricultural research service.

I think, and I guess we at this table would be inclined to believe that we ought to get more of it out into the experiment stations and into the extension service.

Maybe I will just ask Dr. Groenewold and Dr. Brezonik to reaffirm that notion if that is their view as well, and then maybe we will just get it done when we get to marking up this bill.

Mr. **Brezonik**. Well, we certainly don't object to that, but I should point out that the water resources research centers, in fact, do fund projects to people in colleges of agriculture and agricultural extension service and so on. In our Minnesota program this year, we have one project being funded to people in the Department of Agricultural Engineering. In our program beginning in July, we will have three projects funded to people in our College of Agriculture.

Senator **Durenberger**. So, you could live with the provision the way it is, because the way you do it, you are going to farm out some of these projects anyway?

Mr. **Brezonik**. Most of the water resources research centers, in fact, do farm the work out. They do not keep the money in their own institute. We are primarily in-house funding agencies, not only for our own universities but for the other universities with demonstrated research capabilities within their States.

Senator **Durenberger**. Dr. Groenewold?

Mr. **Groenewold**. I would concur with that. There are various ways of doing things. I am not terribly bothered by the current language, but I can see where possibly that is an issue that needs to be addressed.

Senator **Durenberger**. Let me ask just one last question. I think you were all here for the previous panels, and, Dr. Groenewold, I will ask you because you referred several times in a complimentary fashion to S. 20, and I agree with you in general about S. 20 and a lot of the other bills.

However, S. 20 again is sort of standards oriented. It presumes that Mr. Wilbur Wuerty or whoever it is, the farmer who our chairman knows in Arizona, can be saved somehow by standards. Well, he has some standards right now that he looks at when he makes the application, and he finds out within a few years that it doesn't really work that way.

So, as you know from my previous question and your examination of the record so far that I, in my approach, put less reliance on standards and more reliance on control technologies, in other words, what do we do on the surface and what do we inject into the subsurface, and so forth that will help or hinder our efforts rather than trying to deal with today's knowledge base.

Quickly, would you make just a brief observation on those approaches?

Mr. **Groenewold**. My personality, I suspect, is similar to yours in that sense. I prefer a focus on control technology.

I share your belief that if you force it, there will be an awful lot of answers that will suddenly come out, and awful lot of technologies that will suddenly appear. I think we need to force it. I think we are an inventive group of creatures, and I think we are not allowing ourselves to be as inventive as we can be and should be. I think we need to force that issue.

Senator **Durenberger**. I just think it is terribly instructive—and we all do it—to just spend a little time with farmers talking with them about their experiences all the way from atrozine to the latest roundup or whatever the case may be. They are all so knowledgeable about the problem, and it is from them, I think, that I have really come to the strong feeling that we need to deal in prevention, and the best way to deal in prevention is to realistically move in the direction of control and not to ban things and so forth but to continue pushing in that direction.

Dr. Rauschkolb?

Mr. **Rauschkolb**. I just wonder if I could make a brief comment in response to your question. I agree with the approach, and I don't object to the idea of a concentration objective as a measurement, something that you are trying to measure and achieve eventually.

However, especially in the case of ground water when there is such a long transient period between the time you actually conduct a practice and the time that it finally impacts the water table, that can be years. We can't wait years before we see if there is some impact on the ground water.

So, we need to implement control technologies, best management practices, based on the best information we have available and do the kind of research that it takes in order to improve those technologies as we go along.

Senator **Durenberger**. Thank you all very much.

Senator **Baucus**. Thank you, Senator.

Senator Graham.

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Senator **Graham**. Mr. Chairman, I have no questions. I do have a statement which I would like to file.

Senator **Baucus**. Without objection, so ordered. A statement from Senator Mitchell will also be placed in the record at this point.

[The statements referred to follow:]

Opening Statement of Hon. Bob Graham, U.S. Senator From the State of Florida

Chairman Baucus and Chairman Moynihan, I commend you for holding this hearing today to hear Testimony on ground water legislation before our committee. Ground water is a precious resources which we are just now beginning to appreciate fully. We are becoming increasingly aware of just how precious it is, given significant occurrences of contamination and consequent dwindling availability of this supply.

Taking our surface waters as an example, we can look to the recent Ashland spill and the additional contamination of the Ohio River from releases of toxic chemicals. The immediate effect is a jeopardy of the drinking water supply. These events point out the need to be able to rely on long-term alternative water supplies, such as ground water. Furthermore, much of our ground water resources are recharged from surface waters. The obvious result in the case of the Ohio River is ground water contamination from the surface water contamination.

It is time we looked at protection of ground water in a comprehensive fashion. We in Florida are very proud of our program, one of the first State programs of its kind. We have in place a ground water classification system, permitting program, monitoring program, wellhead protection program, well-plugging program, underground injection program, and a spill prevention and emergency response program. All of these efforts are coordinated and are working very well.

It is imperative that they do work well, because over 9 percent of all Floridians rely on ground water as their drinking supply. Additionally, our State has a very high water table, increasing the vulnerability to contamination.

Each State has varied characteristics, posing different risks and different needs relative to ground water protection. It is necessary to integrate the Federal, State, and private knowledge that is available to formulate workable strategies relative to these diverse needs.

I look forward to hearing from the witnesses today and thank both of you for affording this opportunity.

Statement of Hon. George J. Mitchell, U.S. Senator From the State of Maine

Good morning Mr. Chairman, ladies and gentlemen.

I want to express my appreciation to Senator Baucus and Moynihan for their excellent work in developing this series of hearings on ground water protection issues.

Today's hearing, addressing State efforts to assess and protect ground water resources, is especially important and will highlight several of the central ground water policy questions now before this Committee.

We need to hear from witnesses on several key questions.

We need to hear suggestions concerning the proper balance between State and Federal programs for ground water research and monitoring.

We need to find the right balance between State and Federal programs for control of various sources of contaminants.

We need advice on how to develop a strong national policy for protection of the ground water resource which is flexible enough to allow States to address different sources of contamination, different geological conditions, and different institutional structures.

We need suggestions for the best ways to expand and improve existing efforts to provide States with technical and financial assistance for ground water assessment and protection programs.

And, we need to hear the ideas of State and other officials on needed measures to improve coordination and consistency of our own Federal program related to ground water assessment and protection.

I especially look forward to hearing the testimony of the General Accounting Office concerning their recent study of State ground water standards. I know that the role of State standards will be the subject of considerable discussion as we develop ground water legislation and I appreciate having the opportunity to hear the results of this study directly from the GAO.

Again, Mr. Chairman, I want to thank you for holding this hearing and I look forward to working with you in the coming months to develop legislation to protect our ground water resources.

Senator BAUCUS. Are there any other questions?

Senator BURDICK. Yes, I have one question. I have a question here for Dr. Brezonik. This is a rather difficult question, and if you don't care to answer it, that is all right with me, but I would still like to ask the question. Are you prepared to answer such a question?

Mr. BREZONIK. I have to hear it first.

Senator BURDICK. What kind of football team do we have for the fall?

Mr. BREZONIK. I think we are going to have a real good football team in Minnesota this fall, Big Ten champs.

Senator BURDICK. Okay, no more questions.

Senator BAUCUS. Thank you all for taking the time to come today. We appreciate your participation.

The hearing is adjourned.

[Whereupon, at 11:50 a.m., the subcommittees recessed, to reconvene subject to the call of the Chair.]

The hearing is adjourned.

[Statements submitted for the record follow:]

For Release
on Delivery
Expected at
9:30 a.m.
Tuesday,
May 17, 1988

Fighting Groundwater Contamination: State Activities To Date and the Need for More Information From EPA

Statement of
Eleanor Chelimsky, Director
Program Evaluation and
Methodology Division

Before the
Subcommittee on Water Resources,
Transportation, and Infrastructure
Committee on Environment and Public Works
United States Senate

UNITED STATES GENERAL ACCOUNTING OFFICE

GAO/T-PEMD-88-7

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

It is a pleasure to be here today to discuss an issue that is of particular importance to this committee and the nation: fighting groundwater contamination. At the request of Senator Baucus, we have evaluated two specific areas of concern. First, the efforts of the state governments to protect groundwater resources. Second, the information available from the Environmental Protection Agency to help state officials set technically sound groundwater protection standards. My testimony today summarizes the information in our two reports to the Subcommittee on Hazardous Wastes and Toxic Substances.

Introduction and Methodology

Groundwater is a major source of fresh water, used for a wide variety of purposes. The use of groundwater has been increasing at a faster rate than the use of surface water. In 1950, 34 billion gallons per day were used in the United States. This doubled to reach 68 billion gallons per day in 1970 and rose again to 89 billion by 1980, an overall increase of 160 percent in 30 years. Almost two-thirds of withdrawn groundwater is used for irrigation; the remainder is predominantly used for public water supplies and industry. Approximately 11.5 billion gallons of groundwater are used every day for public water supplies, one-third of the total water consumed for this purpose. About 50 percent of the population in the United States relies on groundwater for drinking water. This is the part of the population that would be most immediately affected by groundwater contamination. The population of a few states rely almost totally on groundwater for their drinking water (See Table 1.)

Given this context, it is clear that the efforts of the state governments to protect groundwater are very important. Several contamination protection techniques have been used. The one we focused on is the use of groundwater standards. Other measures of prevention (which are essentially controls over the sources of contamination) include reducing the disposal of wastes on or in the land, enforcing strict standards for sources of contamination, and prohibiting the placement of potential contamination sources above aquifers[1] that are particularly vulnerable to contamination. Groundwater standards, which do not themselves prevent contaminants from entering groundwater, become preventive primarily by playing a role in each of the above techniques.

There are two types of groundwater standards used by the states: numeric and narrative. A numeric standard specifies a maximum concentration of a particular contaminant. A narrative standard specifies a general prohibition against particular types of contaminant discharges or identifies a general level of quality to be achieved.

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[1] An aquifer is a subsurface geological formation of layers of sand, gravel or rock bearing quantities of groundwater.

Table 1: State Reliance on Groundwater for Drinking Water

% drinking water from groundwater	Number of states
0- 10%	1
11- 20	1
21- 30	4
31- 40	8
41- 50	10
51- 60	11
61- 70	9
71- 80	4
81- 90	6
91-100	2
Total	**56**[a]

[a] One respondent did not answer this question

Numeric standards are based upon specific information about the effects of contaminants and the level of protection that is being attempted. A numeric standard is usually based on an estimate of the effect on health and public welfare of exposure to specific levels of a contaminant. Once the standard has been established, conditions of applicability are developed. For example, the standard might be applied to specific classes of groundwater or might be used in setting discharge limits. In our work, we were especially interested in ambient standards, that is, standards applied to groundwater in the ground. Ambient standards constitute the reference points by which groundwater quality is measured.

Establishing narrative standards does not require specific knowledge about contaminants. Narrative standards, because of their general wording, are applied case by case. In addition, if a narrative standard is applied in such a way as to make potential polluters responsible for showing that the standard will not be violated, regulators need not anticipate every possible situation in which contamination may occur.

Both numeric and narrative standards have their disadvantages. The number of contaminants that may enter the environment makes the development of numeric standards for any substantial proportion of the relevant chemicals almost completely infeasible, yet many state governments attempt to set such standards. The flexibility of narrative standards places a heavy administrative burden on regulators to evaluate each permit application. Neither approach has emerged as the first choice of state regulators; indeed, both types of standards may be necessary.

Our evaluation of the state programs focused on five areas: First, the context in which state groundwater standards are developed. Next, the description of the state standards themselves. Third, the differences in state standards. Fourth, the states' standard setting processes. Finally, the application of the standards. We conducted a detailed survey of all 50 states and 7 U.S. territories[2]; our response rate was 100 percent. In addition, we reviewed documentation on all the respondents' groundwater protection programs and conducted an in-depth review of the technical literature.

The Context of State Groundwater Standards

In all but 1 state (Georgia), significant groundwater contamination sources had been identified. Each state has been faced with its own unique set of contamination sources. The most significant concern (mentioned by 50 of the 57 respondents) has been contamination from underground storage tanks. Figure 1 presents the contamination sources listed by our respondents.

All states have some sort of authority for protecting

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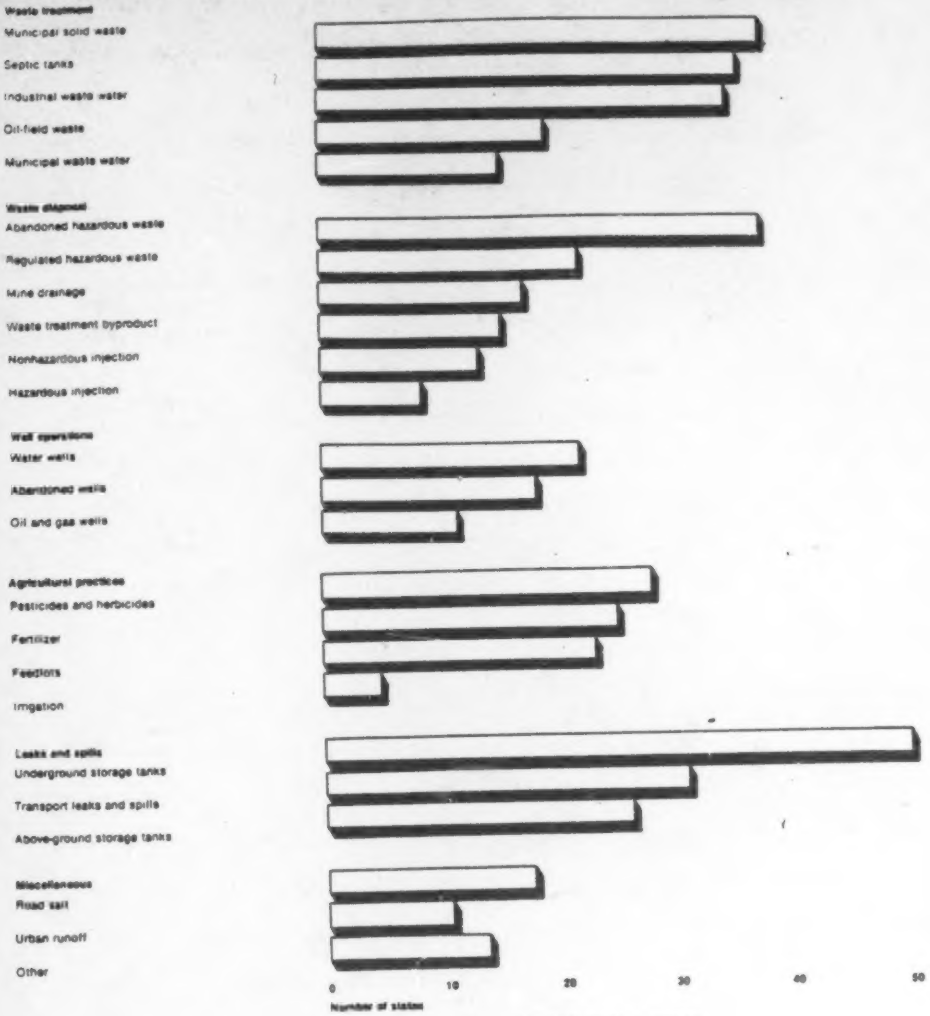
[2] American Samoa, District of Columbia, Guam, Northern Marianas, Puerto Rico, Trust Territory of the Pacific Islands, Virgin Islands

Figure 1: Significant Groundwater Contamination Sources[a]



[a] This question was addressed to all 57 state respondents.

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Testimony

groundwater quality: 15 of 57 respondents operate under specific groundwater legislation, 36 under general water quality legislation. Responsibility for protecting groundwater quality has been vested in designated lead agencies or steering committees in 39 of the 57 respondent cases and was diffused among several state agencies in 16 of the remainder. No trends toward particular legislative or organizational approaches were apparent. (See Tables 2 and 3.)

Only about 40 percent of the respondents (22 of 57) had a groundwater protection plan, but most of the others (31 of 35) had one in development or planned to develop one. Most repondents (50 of 57) indicated that some type of groundwater protection policy guided their groundwater efforts.

A wide range of program activities has been implemented for protecting groundwater quality. In some areas, these activities were better developed than others, yet shortfalls were evident. In particular, about 80 percent of the respondents had made extensive (moderate to very great) efforts to develop groundwater strategies; the extensiveness of this activity may result, at least in part, from the financial support from EPA under the Clean Water Act. About two-thirds of the respondents had made extensive efforts in aquifer mapping and groundwater monitoring, indicating that they were attempting to understand their available resource and contamination problems. However, almost 60 percent of the respondents (33 of 57) had very limited develop-

Table 2: Groundwater Protection Legislation in the 57 States

State[a]	Type of legislation: Specific to groundwater	General water	Quantity of groundwater withdrawn	Other
Alabama		•		
Alaska		•		
American Samoa			•	
Arizona	•[b]			
Arkansas		•		
California		•[b]		
Colorado				•
Connecticut		•		
Delaware			•	
District of Columbia		•		
Florida	•[b]			
Georgia		•[b]		
Guam	•			
Hawaii	•			
Idaho		•		
Illinois		•		
Indiana		•		
Iowa		•		
Kansas		•[b]		
Kentucky		•		
Louisiana		•		
Maine	•[b]			
Maryland		•		
Massachusetts		•		
Michigan		•		
Minnesota		•		
Mississippi			•	
Missouri		•		
Montana	•			
Nebraska	•			
Nevada		•		
New Hampshire	•			
New Jersey		•[b]		
New Mexico	•[b]			
New York	•[b]			
North Carolina		•		
North Dakota		•		
Northern Marianas				•
Ohio		•		
Oklahoma		•[b]		
Oregon	•			
Pennsylvania		•		
Puerto Rico				•
Rhode Island		•		
South Carolina		•		
South Dakota		•		
Texas		•		
Tennessee		•		
Trust Territory of the Pacific Islands		•		
Utah		•		
Vermont	•			
Virgin Islands		•[b]		
Virginia	•[b]			
Washington		•		
West Virginia		•		
Wisconsin	•[b]			
Wyoming	•[b]			
Total	**15**	**36**	**3**	**3**

[a] This question was addressed to all 57 state respondents.

[b] EPA reported specific groundwater legislation in State Ground-Water Program Summaries (Washington, D.C. March 1985).

Table 3: Responsibility for Groundwater Protection in the 57 States

State[a]	Lead agency or steering committee	Diffused authority	No agency responsible
Alabama	•		
Alaska	•[b]		
American Samoa			•
Arizona	•		
Arkansas		•	
California	•		
Colorado	•		
Connecticut	•		
Delaware	•		
District of Columbia	•		
Florida	•		
Georgia	•		
Guam	•		
Hawaii	•		
Idaho	•		
Illinois	•		
Indiana		•	
Iowa		•	
Kansas		•	
Kentucky		•	
Louisiana	•		
Maine		•	
Maryland		•	
Massachusetts		•	
Michigan		•	
Minnesota		•	
Mississippi	•		
Missouri	•		
Montana	•		
Nebraska		•	
Nevada	•[b]		
New Hampshire	•		
New Jersey	•		
New Mexico	•		
New York	•		
North Carolina		•	
North Dakota	•		
Northern Marianas	•		
Ohio	•		
Oklahoma		•	
Oregon	•		
Pennsylvania	•		
Puerto Rico	•		
Rhode Island		•	
South Carolina	•		
South Dakota	•		
Texas		•[b]	
Tennessee	•		
Trust Territory of the Pacific Islands			•
Utah	•		
Vermont	•		
Virgin Islands		•[b]	
Virginia	•[b]		
Washington	•		
West Virginia	•[b]		
Wisconsin	•		
Wyoming	•		
Total	**39**	**16**	**2**

[a] This question was addressed to all 57 state respondents.

[b] EPA did not report a lead agency or steering committee in State Ground-Water Program Summaries (Washington, D.C.: March 1985).

ment of groundwater standards (less than a moderate extent). Since standards play such an important role in the development and application of contamination prevention activities, this means that the latter will be weakened in those areas where development of groundwater standards has been limited. At the time of our survey, the greatest focus for protection was on discharge controls - 80 percent of the respondents had made efforts of moderate or greater extent. That many state programs were still in development may be indicated by relatively little activity reported by 31 of 57 respondents in the interchange of information pertaining to groundwater (less than moderate extent). Tables 4 and 5 respectively characterize the extent of groundwater protection activities and protection policies across the states.

Description of State Standards

At the time of our evaluation, 26 states (of 50 states, 7 territories) had numeric standards specifying quantitative levels for contaminants. Narrative standards had been established in 38 states, many of them the same states that had numeric standards. Only 3 states had numeric standards without also having narrative standards, but 15 states had narrative standards without having numeric standards. Sixteen states had neither numeric nor narrative standards. (See Table 6.)

We found 1,019 numeric standards in 26 states covering 260

Table 4: The Extent of State Groundwater Protection Activities

Activity[a]	No activity	Extent of activity				
		Little	Some	Moderate	Great	Very great
Development of groundwater policy and protection strategy	1	6	5	16	15	14
Development of groundwater standards	7	16	10	5	9	10
Aquifer mapping	2	4	10	23	9	9
Control of discharges to groundwater	1	3	7	13	17	16
Groundwater monitoring	1	8	15	16	14	3
Protection of sole-source aquifers	18	15	10	6	4	2
Contamination response program	2	4	8	14	19	10
Septic management program	1	6	11	16	14	9
Above-ground and underground storage-tank program	4	3	12	13	17	8
Agricultural contamination program	6	8	22	15	5	1
Solid-waste and wastewater disposal program	0	2	6	8	22	19
Underground injection control program	8	1	5	11	18	14
Oil, gas, and water well programs	3	4	6	14	14	13
Exchange of information	4	6	21	13	9	3

[a] This question was addressed to all 57 state respondents. Some did not respond for particular activities.

Table 5: State Groundwater Protection Policies by Type

Policy type	Number of states	
	GAO survey[a]	EPA[b]
Any type	50	31
Nondegradation	29	16
Limited degradation	16	17
Differential protection	16	12
Other	2	•
None	7	•

[a] This question was addressed to all 57 state respondents. More than one policy type could be identified.

[b] U.S. Environmental Protection Agency, State Ground-Water Program Summaries (Washington, D.C., March 1985).

Table 6: Numeric and Narrative Groundwater Standards in the 57 States

State[a]	Numeric	Narrative	Both	None
Alabama				●
Alaska	●			
American Samoa				●
Arizona	●	●	●	
Arkansas				●
California	●	●	●	
Colorado	●	●	●	
Connecticut		●		
Delaware		●		
District of Columbia		●		
Florida	●	●	●	
Georgia	●	●	●	
Guam		●		
Hawaii				●
Idaho	●	●	●	
Illinois	●	●	●	
Indiana		●		
Iowa				●
Kansas				●
Kentucky				●
Louisiana		●		
Maine	●			
Maryland	●	●	●	
Massachusetts	●	●	●	
Michigan		●		
Minnesota	●	●	●	
Mississippi				●
Missouri	●	●	●	
Montana	●	●	●	
Nebraska	●	●	●	
Nevada				●
New Hampshire	●	●	●	
New Jersey	●	●	●	
New Mexico	●	●	●	
New York	●	●	●	
North Carolina	●	●	●	
North Dakota				●
Northern Marianas				●
Ohio		●		
Oklahoma	●	●	●	
Oregon		●		
Pennsylvania				●
Puerto Rico				●
Rhode Island				●
South Carolina	●	●	●	
South Dakota		●		
Texas	●			
Tennessee				●
Trust Territory of the Pacific Islands		●		
Utah				●
Vermont		●		
Virgin Islands		●		
Virginia	●	●	●	
Washington		●		
West Virginia		●		
Wisconsin	●	●	●	
Wyoming	●	●	●	
Total	26	38	23	16

[a]These questions were addressed to all 57 state respondents.

distinct contaminants, with as few as 14 contaminants covered in one state and as many as 190 in another. The contaminants included the physical and radiological characteristics of groundwater, various inorganic compounds, biological substances and, most prominently, organic compounds, including a large number of volatile organic compounds and pesticides. The list included the 34 contaminants covered by EPA's drinking water standards; in fact, these 34 contaminants constituted, on the average, about 62 percent of the numeric standards in each of the states. On the average, 20 states had standards for 19 contaminants not included in EPA's drinking water standards. (See Tables 7 and 8.)

For the most part, the numeric standards were intended to protect human health or drinking water, but in many states they were also intended to protect other uses of groundwater. In some states, different contaminant levels had been established for these different uses.

The states' narrative standards differed considerably, usually specifying some standard or quality, or prohibiting some type of contamination. Their differences made it difficult to count and compare them. Most of the states used their narrative standards to protect human health or groundwater uses. Figure 2 presents data on the bases for narrative standards. A substantial number also intended their standards to protect the environment or made a general prohibition against the introduction of

Table 7: Contaminants Regulated by the States

Class	Contaminant
Physical characteristic of groundwater	Alkalinity, biochemical oxygen demand, chemical oxygen demand, color,[a] corrosivity,[a] dissolved oxygen, odor,[a] pH,[a] taste, temperature, total dissolved solids,[a] total hardness, turbidity[a]
Inorganic compound	
Metal	Antimony, arsenic,[a] barium,[a] beryllium, boron, cadmium,[a] calcium, chromium,[a] copper,[a] iron,[a] lead,[a] magnesium, manganese,[a] mercury,[a] nickel, potassium, selenium,[a] silver,[a] sodium, thallium, zinc[a]
Nonmetal	Ammonia; boric acid, borates, and metaborates as boron; bromide; chloride;[a] cyanide; fluoride;[a] hydrogen sulfide; nitrate as N;[a] nitrate + nitrite as N; nitrite; sulfate[a]
Measure of inorganic contamination	Ammonia nitrogen, foaming agents,[a] specific conductance, total nitrogen
Radiological activity and substance	Beta particle and photon radioactivity;[a] cesium 134; gross alpha particle activity;[a] gross beta particle activity; plutonium 238, 239, and 240; radium 226; radium 226 and radium 228 combined;[a] strontium; thorium 230 and 232; tritium; uranium
Biological substance	Coliform bacteria,[a] fecal coliform bacteria
Organic compound	
Volatile	Benzene; carbon tetrachloride; chlorobenzene, chloroform; 1,2-dibromo-3-chloropropane; 1,2-dibromoethane; p-dichlorobenzene; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethylene; 1,2-dichloroethylene; trans-1,2-dichloroethylene; dichlorofluoromethane; dichloropropanes; 1,2-dichloropropane; cis-1,3-dichloropropene; trans-1,3-dichloropropene, 1,3-dichloropropylene; ethylbenzene; ethylene dibromide; hexachloroethane; methyl chloride; methylene chloride; nitrobenzene; styrene; tetrachlorobenzenes; 1,1,2,2-tetrachloroethane; tetrachloroethylene; 1,1,2,2-tetrachloroethylene; toluene; trichlorobenzenes; 1,1,1-trichloroethane; 1,1,2-trichloroethane; trichloroethylene; trichlorofluoromethane; trichlorotrifluoroethanes; vinyl chloride; m-xylene + p-xylene; o-xylene; xylenes, total
Nonvolatile	Acenaphthene; acetone; acrylic acid; acrylonitrile; alkyl dimethyl benzyl ammonium chloride; alkyl diphenyl oxide sulfonates; aminomethylene phosphonic acid salts; aminopyridine; aniline; anthracene; aryltriazoles; azobenzene; benz(a)anthracene; benzidene; benzisothiazole; benzo(b)-fluoranthene; benzo(k)-fluoranthene; benzo(a)pyrene; bis (2-chloroethyl) ether; bromodichloromethane; bromoform; bromomethane; butoxyethoxyethanol; butoxypropanol; butyl benzyl phthalate; butyl isopropyl phthalate; carbon disulfide; chloroethane; 2-chloroethylvinyl ether; chloromethane; 2-chloronaphthalene; 2-chlorophenol; 5-chloro-o-toluidine; chrysene; dibromochloromethane; dibromodichloromethane; 2,2-dibromo-3-nitrilopropionamide; 3,3'-dichlorobenzidene; 2,4-dichlorophenol; diethyl phthalate; n,n-dimethyl aniline; dimethylformamide; dimethyl phthalate; 2,6-dinitrotoluene; di-n-butyl phthalate; di-(2-ethylhexyl)-phthalate (DEHP); di-n-octyl phthalate; diphenylhydrazine; dodecylguanidine salts; dyphylline; ethylene chlorohydrin; ethylene glycol; ethylene oxide; ethylene thiourea; fluoranthene; fluorene; guaifenesin; hexachlorobutadiene; hexachlorocyclohexanes; hexachlorocyclopentadiene; hexachlorophene; 2-hexanone; hydroquinone; 2-(2-hydroxy-3,5-di-tert-pentylphenyl) benzotriazole; 1-hydroxyethylidene-1,1-diphosphonic acid; indeno (1,2,3-cd) pyrene; isophorone; mercaptobenzothiazole; methacrylic acid; methoxyethylbenzene; methylbenz(a)anthracenes; methylene bisthiocyanate; 4-(1-methylethoxy)-1-butanol; 2-methylethyl-1,3-dioxolane; methyl ethyl ketone; methyl isobutyl ketone; methylmethacrylate; methyl-n-butyl ketone; monohydric phenol; naphthalene; naphthalene (total) (PAHs); niacinamide; nitrilotriacetic acid; n-nitrosodimethylamine; phenanthrene; phenols (total); phenyl ether; phenylpropanolamine; polychlorinated biphenyls (PCBs); pyrene; pyridine; 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD); tetrahydrofuran; theophylline; o-toluidine; tolyltriazole; tributyltin oxide; trimethylbenzenes; trimethylpyridine; triphenyl phosphate
Pesticide	Alachlor; aldicarb; aldicarb + methomyl; aldrin; amiben; atrazine; benefin; bromacil; butachlor; captan; carbaryl; carbofuran; chlordane; 2,4-D;[a] DDT; diazinon; dicamba; dieldrin, dinoseb; dithane; endrin;[a] ferbam; folpet; guthion; heptachlor; heptachlor epoxide; hexachlorobenzene (HCB); kepone; lindane;[a] malathion; maneb; methoxychlor;[a] 2-methyl-4-chlorophenoxyacetic acid (MCPA); mirex; nitralin; paraquat; parathion; pentachloronitrobenzene (PCNB); pentachlorophenol (PCP); phorate; propachlor; propanil; propazine; simazine; 2,4,5-T; thiram; toxaphene;[a] 2,4,5-TP silvex;[a] trifluralin; zineb; ziram
Measure of organic contamination	Carbon chloroform extract, oil and grease, organic nitrogen, petroleum hydrocarbons, total organic carbon
Other	Total organic halogen, total trihalomethanes[a]

[a] Contaminant also regulated by EPA.

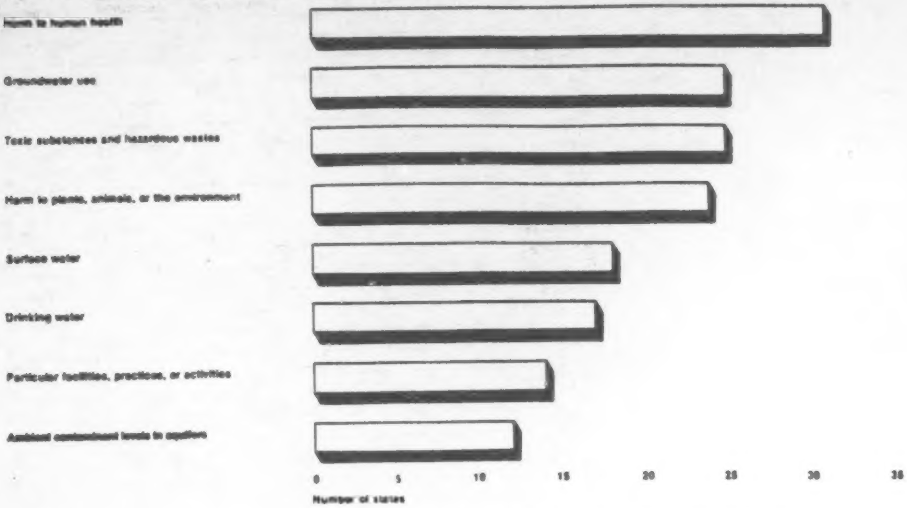
Table 8: The Total Number of Numeric Groundwater Standards by State

State	Primary standards[a]	Secondary standards[a]	Total number
Alaska	21	12	39
Arizona	22	0	22
California[b]	•	•	•
Colorado	20	11	42
Florida	22	12	43
Georgia	22	0	22
Idaho	22	12	35
Illinois	17	10	46
Maine	22	9	33
Maryland	14	0	14
Massachusetts	21	7	28
Minnesota	12	10	25
Missouri	17	6	47
Montana	22	0	25
Nebraska	19	8	28
New Hampshire	22	12	38
New Jersey	16	11	39
New Mexico	11	8	41
New York	16	8	190
North Carolina	20	6	30
Oklahoma	0	0	36
South Carolina	21	12	33
Texas	22	12	35
Virginia	15	4	36
Wisconsin	16	11	63
Wyoming	12	8	29
Total	**444**	**189**	**1,019**

[a] Substances on the list of EPA primary or secondary standards for which the state had a standard

[b] The total number is unknown. California's standards are set regionally and do not apply to the entire state. California's officials did not provide copies of any standards.

Figure 2: Narrative Standards by Criterion[a]



[a] This question was addressed only to the 38 respondents whose states had narrative standards

toxic or hazardous substances into groundwater (in contrast to the numeric standards' specification of levels of contaminants that were permissible). Some state standards made general reference to EPA's drinking water or surface water standards (and allowed for future standards EPA may adopt) or to existing or background levels of contaminants in ambient groundwater (thereby covering contaminants not naturally present or present at a specific level). Many of these standards seemed to cover the same situations that were encompassed by specific numeric standards.

The groundwater standards were applied to groundwater in a variety of ways. Many states simply applied their standards to all groundwater; others specified their application to specific types of groundwater. Many states applied the standards to groundwater as a source of drinking water, while another large group of states seemed concerned most with the groundwater around the places where contaminants were likely to be discharged. Several states based the application of their standards on some classification scheme or applied them only to groundwater of a certain quality or to sole-source aquifers.

Eleven of the 26 states had adopted numeric standards since early 1983, only 2 since late 1985. Several other states were considering the adoption of numeric standards. Our data suggest that between 40 and 220 numeric standards were being added each year across all states, with lower numbers in the last 2 years and most of the new standards adopted by states that previously had none. At this rate, it could take as long as 40 years to adopt numeric standards in all states for half of the contaminants now regulated in at least one state. The slow pace at which the states are adopting standards raises the question of whether protection from contamination is adequate.

Differences in State Groundwater Standards

Each state with numeric standards seems to have relied to a great extent on the federal drinking water standards. Approximately 62 percent of the states' numeric standards corresponded to federal drinking water standards. However, adoption of the federal standards was not treated as an absolute rule. On the average, states with numeric standards adopted 18 of the 22 federal primary standards and 8 of the 12 secondary standards. The most notable differences from the federal list were some states' omission of EPA's biological, radiological and physical standards. Five states with numeric standards did not include any of EPA's secondary standards.

We found several differences from the levels of contamination permitted in the federal standards, including some in states that adopted groundwater standards by reference to their drinking water standards. Many differences appeared in the states that adopted their standards some time ago and have not updated them;

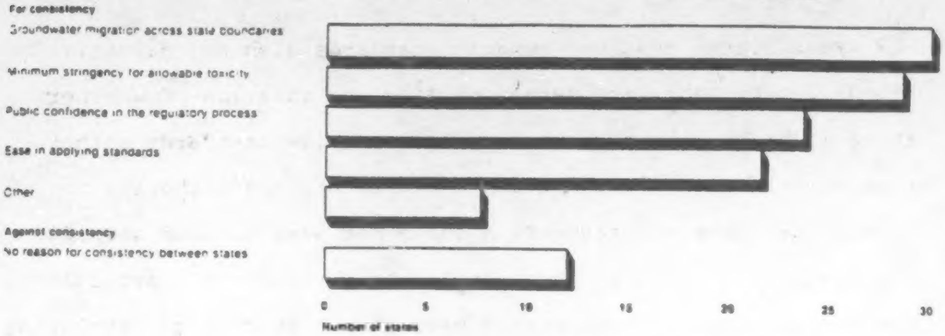
the levels set in these states may not reflect the latest information on the contaminants. Notwithstanding, some states have based levels that are different -- higher for some standards and lower for others -- on the specific consideration of appropriateness of the federal standards to conditions in the states. In general, state officials believed that the federal drinking water standards could be used as the basis for ambient numeric groundwater standards if some consideration were given to (1) uses of groundwater other than for drinking, (2) natural background conditions and, (3) social and economic costs in protecting groundwater to a specified level.

Across the 20 states that adopted standards for contaminants not included in the federal drinking water standards, we found very little consistency as to which other contaminants were included. Beyond those on the EPA list, an additional 226 contaminants were included in 386 state standards, an average of fewer than 2 standards per contaminant. In most of the states, it appears that the additional standards were not based on the actual detection of contaminants. There is apparently a much greater likelihood that the standards that were adopted more recently were based on contaminants actually detected or posing a demonstrated threat. A large portion of these recently adopted standards regulated volatile organic compounds and, in some western states, certain types of radiological substances. No two states had the same set of numeric standards (except states that incorporated the federal standards by reference). Despite this, a large majority of state officials were, for a variety of reasons, in favor of interstate consistency for groundwater standards. (See Figure 3.)

A similar variability appears widespread with respect to narrative standards, for which the states have no federal example to follow. These standards provide case by case criteria, and the criteria vary considerably from state to state. Nonetheless, narrative standards do seem to adhere to an overall structure, specifically covering the discharge of certain amounts of contaminants into groundwater and affecting how the groundwater can be used. These standards give the states considerable flexibility in protecting groundwater but may be unevenly applied.

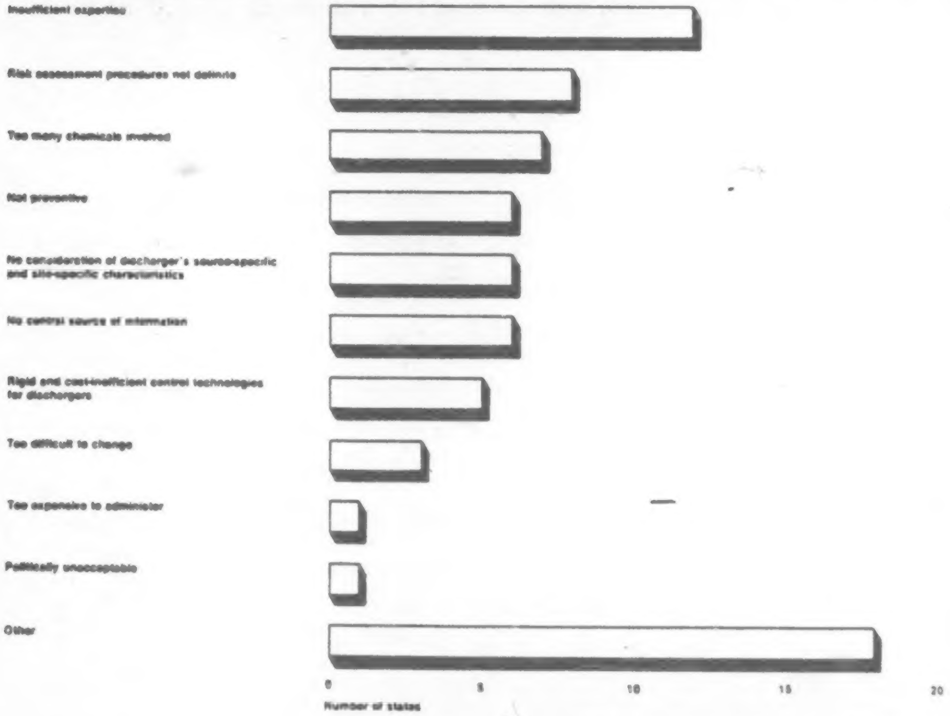
No factor seems directly linked to the establishment of numeric or narrative standards or both. The existence of standards -- or conversely, the absence of standards in 16 states -- did not seem to be related to the types of groundwater problems within a state or the extent to which a state relied on groundwater for its drinking water. The best explanation, one that has been posited in the literature, is that the development of standards is based on the political orientation of a state. In other words, it appears that a concern about potential groundwater contamination leads to the implementation of protective measures that invariably reflect some standard of acceptable groundwater quality. Figure 4 details the reasons our respondents

Figure 3: Reasons For and Against Consistency Between the States on Ambient Groundwater Standards[a]



[a]This question was addressed to all 57 state respondents. If a respondent's position was for consistency, more than one reason could be given.

Figure 4: Reasons for Not Having Numeric Standards[a]



[a]This question was addressed only to the 31 respondents whose states did not have numeric standards. Respondents from 2 territories did not answer the question.

gave for not having numeric standards.

Most states that had numeric standards also had narrative standards, but not vice versa, raising the question of whether there might be a trend toward using narrative standards rather than numeric ones. The states generally had the authority to develop groundwater standards and did not seem to need specific legislation in order to enact groundwater standards, particularly numeric standards. Some states were in the process of developing or considering the development of standards, although some of these had been slowed by technical or informational constraints. However, some states seemed to believe that numeric standards are not the best choice and that narrative standards should be used instead.

We found that groundwater programs with standards appeared in states where responsibility for groundwater protection was not assigned to a lead agency, where groundwater protection plans had not been developed and where they were not independent of the groundwater protection policy that had been established. This runs counter to predictive relationships involving these indicators that have been hypothesized in the literature. That is, while these indicators may well describe what is happening within a state, our data do not support the idea that they are prerequisites for developing groundwater standards.

The States' Standard-Setting Processes

Most of the states with numeric standards did not have well-developed procedures for setting their standards by themselves. Respondents from only a few states indicated that their states' procedures could be considered well-developed; the remainder indicated that they relied substantially on the federal government or others for primary information concerning contaminants. Most of the states involved the public in the standard-setting activities, primarily to ascertain whether there was sufficient public support for the establishment of standards. For most of the states, the major activity seemed to be the development of conditions for permits and responses to contamination incidents. In this regard, it appears that the states relied to a great extent on permit holders to demonstrate that their activities would not violate standards. Table 9 characterizes the procedures for setting and applying standards.

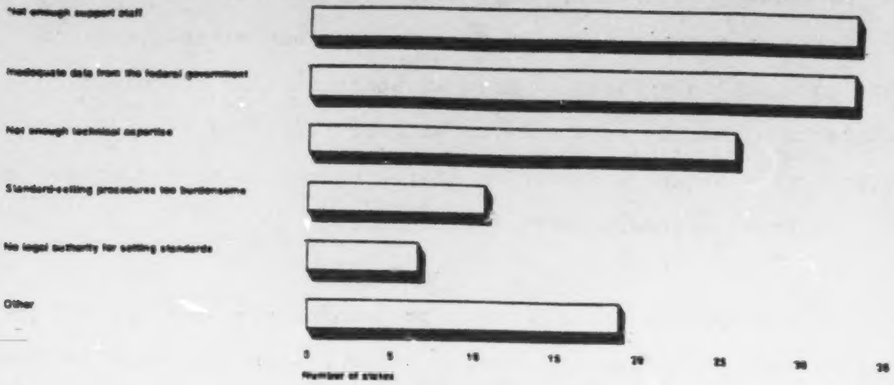
The major limitations on the standard-setting process were resource constraints, including insufficient finances and technical and support staff, along with a perceived inadequacy of information from the federal government. (See Figure 5.) For these reasons, officials from some states believed their states would have a difficult time implementing standards for 100 contaminants, as has been proposed in some legislation.

Table 9: The Number of States Using Nine Procedures in Setting and Applying Standards

	Extent of use[a]				
Type of procedure	Little or none	Some	Moderate	Great	Very great
Identify possible additions to a list of contaminants	10	6	5	4	5
Assess risks, including effects on health, costs and benefits, and technical feasibility and practicability	7	8	6	4	5
Obtain information on the environmental source and fate of a substance and measures for minimizing its concentration in groundwater	5	7	11	4	3
Develop proposed standard from existing federal or state standards	3	0	3	8	15
Develop a standard from medical evidence, such as dose response	11	8	4	2	4
Prepare a document proposing a standard, present evidence, and request public comment	10	3	5	3	7
Hold public hearings or otherwise obtain public comment	4	4	5	5	11
Develop conditions for permits to ensure a standard is not exceeded	3	2	6	10	9
Develop responses to exceeding a standard	4	2	9	10	5

[a] This question was addressed only to the 41 states with numeric or narrative standards. Many of the states with narrative standards only chose not to respond to this question. Thirty respondents answered the question.

Figure 5: Constraints on Setting Groundwater Standards[a]



[a] Respondents could indicate more than one type of constraint.

It appears that 20 of the 26 states with numeric standards had relatively minimal standard-setting processes and relied primarily on federal drinking water or surface water standards, substantially incorporating them as state numeric groundwater standards either by reference or without referring to groundwater. Five of the 6 remaining states seemed to have considerably stronger standard-setting procedures.

In the more advanced states, procedures for identifying new contaminants to add to the list of numeric standards were fairly consistent. They relied to a great extent on the detection of contaminants through monitoring. At least 2 states made use of such information as data on the use of chemicals and land-use records to augment their ability to identify likely contaminants. Once the threat of particular contaminants had been recognized, these states based their priorities for setting standards on an assessment of their relative threat. These states used federally developed evidence for setting levels for standards when such information was available. When it was not, they set the levels themselves, using procedures specified in regulations or laws and usually taking uncertainty factors into account. There would be considerable duplication of effort across the states in developing this information for contaminants for which information was not available from other sources.

The lack of available information for setting standards seemed to represent one of the biggest problems for state officials. They reported that they did not have the resources to gather primary medical and chemical information on contaminants. Their belief is that much of this type of information should be provided by the federal government, preferably through a single source, such as a criteria document. They did not believe that the information they were presently receiving was adequate and in many cases thought that the federal government had a primary responsibility for providing specific information.

The information state officials thought was most important to receive concerned the effects of the contaminants on health and existing guidelines and standards pertaining to these contaminants. Their view was that states did not have the resources or the technical skills to develop toxicological data or information on risks to health or effects on health, seemingly relying as much as possible on federal sources, preferably guidelines and standards. The respondents to our survey viewed as important other information specific to contaminants, including information on the environmental fate of contaminants, analytical chemistry, human exposure, the technological feasibility of controlling contaminants, and monitoring methods. Most of our respondents seemed to believe that criteria documents would be a useful vehicle for these types of information. However, they also seemed to believe that the states can obtain necessary information on the potential sources of contaminants and assessments of their threats within the states. The gap between what the states needed when we made our survey and what they received seemed to be rather large.

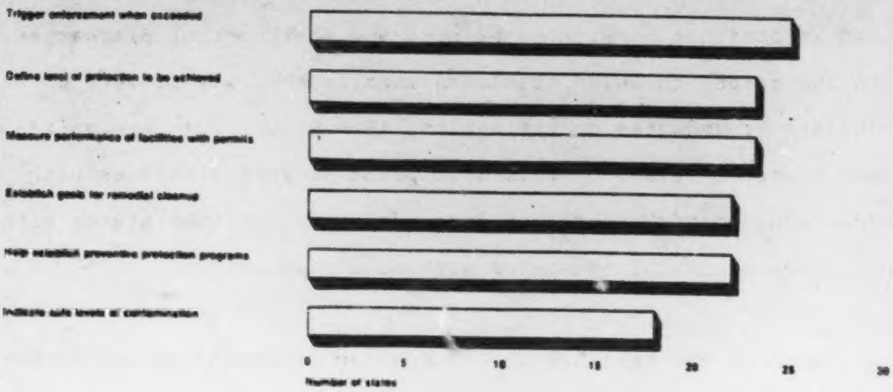
The Application of Standards

It is very difficult to know precisely how the states' standards were used. However, our study does allow us to identify the principal areas where they were used. Figure 6 characterizes the states' use of groundwater standards. The standards were used in most states to trigger enforcement and to assess permit performance for those who might discharge contaminants. In addition, the standards were used to define the level of protection a state intended to achieve, indicate safe levels of contamination, establish preventive programs, and establish goals for remedial actions. However, how the states actually implemented these objectives in state programs and how well the objectives were met is completely unknown at the present time.

Groundwater standards were used in most states as a guide for permit applicants and for those who established allowable levels of contamination under permit programs. The standards were also sometimes used in establishing discharge permits and in shutting down wells to protect the public. However, in many states, variances to standards were allowed for specific reasons; the extent to which variances weakened the force of the groundwater standards or permit conditions is unknown.

The extent to which standards are used in permit programs

Figure 6: State Use of Groundwater Standards[a]



[a] This question was addressed to the 28 states that had numeric standards.

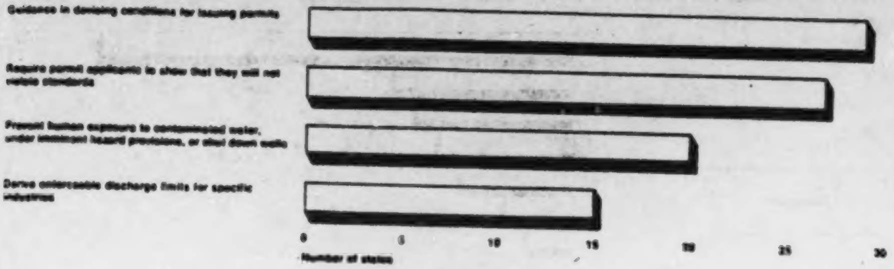
makes it important to determine the extent to which permits cover discharges that may affect groundwater, how these permits are used in conjunction with other programs that control discharges, and the extent to which standards used in this way prevent or mitigate groundwater contamination. (See Figure 7.) A significant question raised by this last point is whether states with numeric standards experience less contamination than states with narrative standards or states without any standards.

Most of the states with groundwater standards seemed to have monitoring programs, apparently recognizing that groundwater standards would be largely meaningless without monitoring. (See Figure 8.) Groundwater standards had also been incorporated into groundwater classification systems, in states that had both, either by requiring specifically classified groundwater to meet these standards or by setting up different standards for different categories. The incorporation of standards into classification systems provided a concrete guide for the states in determining the value of particular groundwater. The evolution of a classification system apparently goes hand-in-hand with the evolution of a state's groundwater standards. Figure 9 presents the bases for state classification systems.

Information States Need to Develop Standards

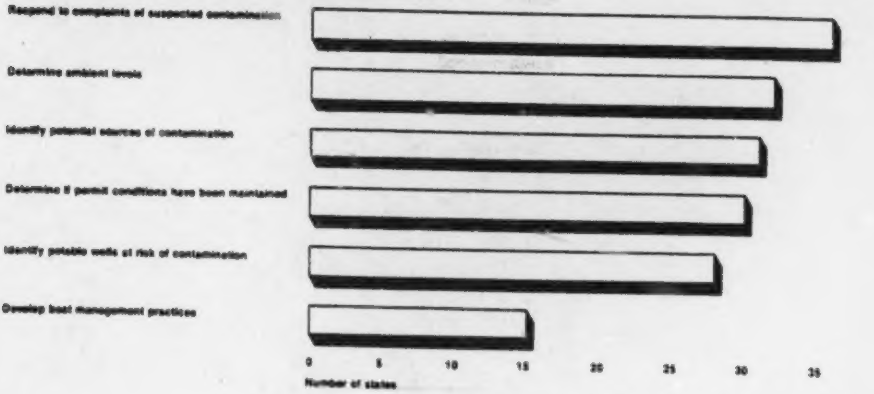
Our second evaluation was designed to examine what information the states need to develop technically sound standards and

Figure 7: State Use of Standards in Permit Programs[a]



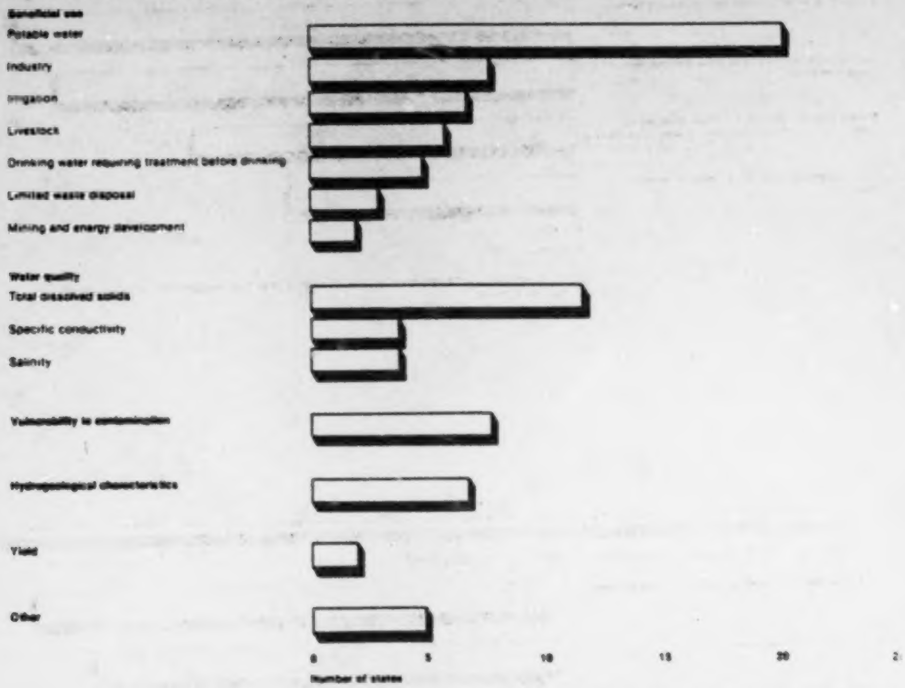
[a] This question was addressed to the 41 states that had numeric or narrative standards: 6 did not answer.

Figure 8: The Purposes of Groundwater Monitoring Programs[a]



[a] This question was addressed to the 41 states that had numeric or narrative standards 2 did not answer.

Figure 9: The Bases for State Classification Systems[a]



[a] This question was addressed to the 25 states that had numeric or narrative standards and a classification system.

whether that information is currently available from EPA. More precisely, we wanted to determine what types of information the states need to set groundwater standards, to what extent the information is currently available in EPA technical documents, whether there is a need for more information on groundwater contaminants and, if so, how that need can be met. Since the states readily adopt drinking water standards as groundwater standards, we were also interested in what drinking water standards had been set and what standards were planned for development. Our methodology included the use of the same survey mentioned earlier as well as a detailed review of technical documents developed by EPA.

Information Needs

We asked the state respondents to consider 12 information areas that, with the assistance of members of the Committee on Groundwater of the National Academy of Sciences, we had identified as being important for setting groundwater standards. The areas were:

1. the analytical chemistry of substances,
2. the environmental fate of substances,
3. the presence of substances in groundwater and their proximity to groundwater users,
4. the amount and location of the production and disposal of substances in the states,

5. monitoring methods for contaminants,
6. the technological feasibility of control,
7. human exposure,
8. the effects of contaminants on human health,
9. existing guidelines and standards,
10. references for further information,
11. contacts for additional information, and
12. how to use the information to set groundwater standards.

The respondents from the majority of the states cited all but the third and fourth information areas as "moderately important," "very important," or "essential." They also viewed the federal government as the principal source of this information.

Extent to Which Information is Available from EPA

The most basic type of information that the states have used for setting groundwater standards is drinking water standards. Twenty-two drinking water standards for individual contaminants had been issued prior to July 1987; 20 of the 22 are being revised. In 1982 and 1983, EPA's Office of Drinking Water announced that it was reviewing 63 other contaminants for possible regulation. In July, 1987, EPA issued standards for 8 of these contaminants. Consequently, we focused our evaluation of what information is available on the 83 contaminants which were being revised or newly established. Table 10 provides a

Table 10: EPA's Statutory Dates for Regulating 83 Contaminants

Date	Type	Contaminant
June 1987[a]	Volatile organic compounds and fluoride	Benzene; carbon tetrachloride; 1,2-dichloroethane; 1,1-dichloroethylene; fluoride; paradichlorobenzene; 1,1,1-trichloroethane; trichloroethylene; vinyl chloride
June 1988[b]	Inorganic compound	Arsenic, asbestos, barium, cadmium, chromium, copper, lead mercury, nitrate, selenium
	Organic compound	Acrylamide; alachlor; aldicarb; carbofuran; chlordane; chlorobenzene 2,4-D; dibromochloroproprane (DBCP); cis-1,2-dichloroethylene trans-1,2-dichloroethylene; 1,2-dichloropropane; epichlorohydrin ethylene dibromide; lindane; methoxychlor; ortho-dichlorobenzene pentachlorophenol; polychlorinated biphenyls (PCBs) tetrachloroethylene; toluene; toxaphene; 2,4,5-TP; xylene
	Microbiological or physical characteristic	Coliform bacteria, giardia lamblia, legionella, standard plate count turbidity, viruses
June 1989[c]	Inorganic compound	Antimony, beryllium, cyanide, nickel, nitrite,[c] sulfate, thallium
	Organic compound	Adipates; aldicarb sulfone;[c] aldicarb sulfoxide;[c] atrazine; dalapon dinoseb; diquat; endothall; endrin; ethylbenzene;[c] glyphosate; heptachlor;[c] heptachlor epoxide;[c] hexachlorocyclopentadiene methylene chloride; PAHs; phthalates; pichloram; simazine;, styrene;[c] 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD); trichlorobenzenes; 1,1,2-trichloroethane; vydate
	Radiological activity or substance	Beta particle and photon activity, gross alpha particle activity, radium 226 and 228, radon, uranium

[a] EPA issued regulations for these contaminants by July 1987

[b] Advance notice has been published for these 39 compounds. EPA proposes to meet the requirement that 40 be regulated by June 1988 by adding one compound not in the statutory list

[c] Substituted in the list in July 1987

list of the contaminants and EPA's statutory dates for their regulation.

We reviewed EPA's published technical documents on the 83 contaminants. In the opinion of the Director of EPA's Office of Groundwater Protection, this office would consider these 83 contaminants first, were it directed to issue criteria documents for groundwater contaminants. Criteria documents reporting information on contaminants of concern are issued by a number of program offices within EPA. They may be prepared as background to a regulatory action or as general information, and they vary in breadth and detail. EPA does not issue criteria documents on pollutants as contaminants of groundwater resources.

We identified 247 documents that deal with 1 or more of the 83 contaminants. We examined them for the 12 types of information applicable to setting groundwater standards. Some information areas were fairly well-covered for the 83 contaminants. However, we identified a substantial gap between what is currently available on the 83 contaminants and what would be needed if groundwater standards were to be developed. That gap was the most significant for 8 of the 83 contaminants; we found no information for these 8. For an additional 15 substances, fewer than 6 of the 12 areas were covered. We found no information on how to set groundwater standards. We also found that no collection of documents (or document series) for a single contaminant covered all 12 areas of information.

If the states are to set technically sound groundwater standards, they will need more information from EPA or elsewhere. Working with current information resources is difficult because, although many of the 247 EPA documents provide some information related to groundwater contaminants, no single document series is devoted specifically to groundwater contaminants. A substantial effort would be required to synthesize information for any one contaminant.

As mentioned earlier, we found that 260 substances are regulated by one or more states as groundwater contaminants. There is a significant difference between that number and the number of contaminants regulated as drinking water contaminants. If EPA meets the timetable set out in the Safe Drinking Water Act Amendments of 1986, and sets standards for the 83 substances, the gap will be narrowed. However, there will very likely still be a gap between the number of groundwater contaminants the states are concerned with and the number that EPA regulates as drinking water contaminants. Therefore, the states' requirements for information upon which to set groundwater standards cannot be fully met by the information to be developed by EPA in the near term.

The Need for More Information and How It Can Be Met

In the absence of a federal program to establish groundwater standards, 41 of the 57 respondents have set their own numeric or narrative standards for some contaminants. (The median number of contaminants regulated by state statute is 35.) Many state officials believe they are prevented from effectively setting standards by a lack of information on groundwater contaminants. When the states do proceed on their own, they often duplicate one another's efforts in collecting and analyzing information. A substantial gap exists between the information requirements of the states for setting groundwater standards and the information that is available from the federal sector. Additional information about contaminants should be developed and disseminated if state standards are to be developed in an efficient and technically sound fashion.

Because information on given contaminants is often dispersed in several different documents, it is harder to use and some information may be overlooked altogether. The states' standard-setting programs would benefit most from a single, centralized reference source for groundwater contaminants--that is, a criteria document series. The Environmental Protection Agency is clearly the appropriate organization to develop such information.

EPA has a history of serving as a reference source for drinking water, surface water, and other regulatory areas. In addition, EPA has some regulatory responsibilities for groundwater, has developed and provided a national groundwater protection strategy to state governments, and continues to work closely with the states. During fiscal years 1985 and 1986, EPA dispensed approximately $14 million in grants to assist the states in designing and implementing groundwater protection programs, many of which rely on EPA's standards. EPA recognizes the use of standards as tools for establishing specific goals for groundwater protection, determining compliance with and enforcing those goals, and assessing the success of protection programs. Providing the information the states need to establish groundwater protection standards would be consistent with EPA's current goals and efforts.

Finally, we do not believe that groundwater criteria documents should necessarily be established for the contaminants that EPA has proposed to regulate under the drinking water program. The risks that some substances pose for groundwater may be different from the risks they pose for drinking water.

We recommend that EPA establish a criteria document program specifically for groundwater contaminants. The groundwater contaminants addressed should be those that pose the greatest risks.

This concludes my remarks. I would be happy to answer any questions you might have.

TESTIMONY
OF
THOMAS C. JORLING
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
COMMISSIONER
BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES,
TRANSPORTATION AND INFRASTRUCTURE
AND THE
SUBCOMMITTEE ON HAZARDOUS WASTES
AND TOXIC SUBSTANCES
OF THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

MAY 17, 1988

I WOULD LIKE TO THANK YOU, CHAIRMAN MOYNIHAN AND CHAIRMAN BAUCUS AND MEMBERS OF THE SUBCOMMITTEES, FOR THE OPPORTUNITY TO COMMUNICATE MY THOUGHTS REGARDING THE MANAGEMENT OF GROUNDWATER RESOURCES AND GROUNDWATER LEGISLATION PENDING BEFORE THE COMMITTEE.

NEW YORK STATE WAS ONE OF THE FIRST STATES IN THE NATION TO RECOGNIZE THE CRITICAL IMPORTANCE OF GROUNDWATER AS A DRINKING WATER SOURCE. NEW YORK ESTABLISHED ONE OF THE MOST COMPREHENSIVE SETS OF AMBIENT GROUNDWATER QUALITY STANDARDS AS LONG AGO AS 1978. THESE GROUNDWATER CLASS "GA" STANDARDS, WHICH ARE AT LEAST AS STRINGENT AS THE DEPARTMENT OF HEALTH'S DRINKING WATER STANDARDS, ARE DIRECTLY TIED TO EFFLUENT STANDARDS FOR DISCHARGES TO GROUNDWATER WHICH ARE PERMITTED UNDER THE STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES). THESE STANDARDS ARE ALSO USED TO EVALUATE THE IMPACTS OF WASTE DISPOSAL SITES AS WELL AS OTHER POTENTIAL CONTAMINATION SOURCES. CURRENTLY, ALL FRESH GROUNDWATERS IN NEW YORK ARE ASSIGNED TO CLASS "GA", WITH BEST USE AS A DRINKING WATER SOURCE.

NEW YORK WAS ALSO ONE OF THE FIRST STATES TO DEVELOP A COMPREHENSIVE GROUNDWATER MANAGEMENT STRATEGY. IMPORTANT

ELEMENTS OF THIS STRATEGY INCLUDE A STRONG EMPHASIS ON PROBLEM PREVENTION AND A GEOGRAPHIC TARGETING CONCEPT TO FOCUS SPECIAL ATTENTION ON THE MOST CRITICAL RECHARGE AREAS. THIS LATTER POLICY WAS ADOPTED AS PART OF THE FEDERAL WELLHEAD PROTECTION PROGRAM WITHIN THE SAFE DRINKING WATER ACT. NEW YORK'S MULTIFACETED GROUNDWATER PROGRAM HAS INCLUDED THE ESTABLISHMENT OF A PERMIT SYSTEM FOR GROUNDWATER DISCHARGES WITH SPECIFIC EFFLUENT LIMITATIONS, DEVELOPMENT OF COMPREHENSIVE BULK STORAGE REGULATIONS (PETROLEUM AND, MORE RECENTLY, A WIDE ARRAY OF CHEMICALS), SIGNIFICANT EXPANSION OF OUR SPILL RESPONSE PROGRAM, AND A STRONG EMPHASIS ON RESOURCE ASSESSMENT (MAPPING AND DATA MANAGEMENT) AND PUBLIC AND LOCAL GOVERNMENT EDUCATION.

DESPITE THIS RECORD OF PROGRESS, NEW YORK SEES A MAJOR NEED FOR FEDERAL GOVERNMENT ACTIVITY IN GROUNDWATER MANAGEMENT ISSUES. NEW YORK, AS MOST STATES, MUST DEVOTE MOST OF

ITS RESOURCES TO THE OPERATION OF PROGRAMS. THE COMPLEXITIES OF GROUNDWATER SYSTEMS AND POLLUTION SOURCES DEMAND THAT SIGNIFICANT ATTENTION BE ADDRESSED TO RESEARCH, DEVELOPMENT AND DEMONSTRATION PROJECTS. THE PRINCIPAL ROLE OF THE FEDERAL GOVERNMENT SHOULD FOCUS ON THESE ACTIVITIES AND ON TECHNOLOGY TRANSFER AND EDUCATION. FUNDING OF SUCH ACTIVITIES AT THE FEDERAL LEVEL IS A CRITICAL NEED. THERE IS ALSO A SIGNIFICANT NEED FOR FEDERAL FUNDS TO BE ALLOCATED TO STATE ACTIVITIES IN THE SAFE DRINKING WATER ACT'S WELLHEAD PROTECTION PROGRAM (SECTION 1428) AND SOLE SOURCE AQUIFER DEMONSTRATION PROGRAM (SECTION 1424). FUNDS ARE ALSO NEEDED FOR STUDIES OF WATER POLLUTION PROBLEMS IN THE LONG ISLAND AQUIFER, AS PROVIDED IN SECTION 520 OF THE PROVISIONS OF PL 100-4, AND FOR NONPOINT SOURCE MANAGEMENT PROGRAMS, AS PROVIDED IN SECTION 319 OF THE WATER QUALITY ACT OF 1987.

ALTHOUGH OUR POSITION IS THAT THE REGULATORY MANAGEMENT OF GROUNDWATER IS THE RESPONSIBILITY OF THE STATES, WE RECOGNIZE THAT THERE IS A STRONG NEED FOR CERTAIN FEDERAL ACTIONS THAT WILL BE DIRECTLY UTILIZED IN STATE PROGRAMS. THE FIRST OF THESE IS HEALTH RISK ASSESSMENTS FOR GROUNDWATER CONTAMINANTS AND THE DEVELOPMENT OF GROUNDWATER QUALITY CRITERIA. STATES MUST RETAIN THE AUTHORITY TO DETERMINE HOW TO APPLY SUCH CRITERIA (ESTABLISHMENT OF STANDARDS, APPLICATION OF STANDARDS, DESIGN AND APPROPRIATENESS OF MONITORING). BUT STATES ARE GENERALLY UNABLE TO COMMAND THE CONSIDERABLE RESEARCH RESOURCES NECESSARY TO DEVELOP HEALTH ADVISORIES. HEALTH RISK ADVISORIES AND CRITERIA AND STANDARDS FORM A FOUNDATION FOR MUCH OF OUR GROUNDWATER PROTECTION EFFORTS.

THE BEHAVIOR OF CHEMICALS, ONCE RELEASED INTO THE ENVIRONMENT, IS ANOTHER SIGNIFICANT FIELD OF RESEARCH

REQUIRING ATTENTION AT THE FEDERAL LEVEL. STATES MAY DIRECTLY APPLY THE RESULTS OF SUCH RESEARCH TO THE DESIGN OF MONITORING PROGRAMS, THE REGULATION OF PESTICIDES, TREATMENT AND REMEDIATION OF CONTAMINATED GROUNDWATER, EVALUATING THE SIGNIFICANCE OF POLLUTION SOURCES (INCLUDING NONPOINT), AND TO THE CONTROL OF VARIOUS INDUSTRIAL, COMMERCIAL AND DOMESTIC CHEMICALS. THIS FIELD OF RESEARCH MAY NOT ALWAYS YIELD RESULTS AS QUICKLY AS OTHERS, BUT POLLUTANT MONITORING AND REMEDIATION EFFORTS ABSOLUTELY DEPEND ON SUCH KNOWLEDGE. CHEMICAL FATE RESEARCH, THEREFORE, SHOULD ALSO BE A MAJOR FEDERAL PRIORITY.

THE THIRD PRINCIPAL AREA OF RESEARCH THAT SHOULD BE A MAJOR FEDERAL PRIORITY IS HYDROGEOLOGY AND RESOURCE ASSESSMENT. STATES MAY DIRECTLY APPLY THE RESULTS OF THIS WORK TO GROUNDWATER QUANTITY MANAGEMENT, THE DESIGN OF MONITORING AND REMEDIATION EFFORTS, SITING OF SPECIAL FACILITIES (WASTE

TREATMENT AND OTHER SIGNIFICANT SOURCES), WATER SUPPLY PLANNING, AND TO A WIDE RANGE OF GROUNDWATER PROTECTION ISSUES THAT DEPEND ON GEOGRAPHIC TARGETING (INCLUDING LOCAL LAND USE PLANNING AND ZONING).

CERTAIN ASPECTS OF HYDROGEOLOGY AND RESOURCE ASSESSMENT RESEARCH ARE COMPLEX BUT STILL WARRANT IMMEDIATE ATTENTION. EXAMPLES INCLUDE WATER MOVEMENT IN FRACTURED BEDROCK, IMPROVED MODELLING OF GROUNDWATER MOVEMENT, AND INTERACTIONS IN THE UNSATURATED ZONE. NEVERTHELESS, IN MOST AREAS, THE GREATEST HYDROGEOLOGIC INFORMATION NEEDS ARE SIMPLE AND STRAIGHTFORWARD; DATA COLLECTION, INTERPRETATION, MANAGEMENT, AND DISSEMINATION ARE FUNDAMENTAL NEEDS THAT CAN GENERALLY BE ACCOMPLISHED WITH OUR CURRENT SCIENTIFIC AND TECHNICAL ABILITIES. AQUIFER MAPPING, GATHERING AND EVALUATING EXISTING DATA, DETERMINING NEW GEOLOGIC DATA NEEDS, AND DEMONSTRATING METHODS FOR APPLYING THIS INFORMATION ARE AS

CRITICAL AS MORE FUNDAMENTAL AREAS OF RESEARCH. THESE TYPES OF INFORMATION CAN BE UTILIZED IN DEVELOPING THE IMPORTANT COMPUTER TOOLS FOR GROUNDWATER MANAGEMENT, GEOGRAPHIC INFORMATION SYSTEMS (MAP INFORMATION) AND MANAGEMENT INFORMATION SYSTEMS (OTHER DATA). THESE TOOLS ARE ALSO NOT COMPLEX, AND THE GREATEST NEEDS ARE HUMAN RESOURCES AND CURRENTLY AVAILABLE HARDWARE.

THESE BROAD AREAS OF NEEDED FEDERAL RESEARCH, DEVELOPMENT AND DEMONSTRATION ARE GENERALLY WELL REFLECTED IN THE CURRENT LEGISLATION S.1105 AND H.R. 791, AND TO A LESSER DEGREE IN S.20. WE DO NOT SEE A SIGNIFICANT NEED TO DEVELOP NEW INSTITUTIONS OR MECHANISMS FOR PERFORMING AND COORDINATING SUCH ACTIVITIES. EXISTING UNIVERSITIES, RESEARCH CENTERS, WATER RESOURCE INSTITUTES, AND FEDERAL COMMITTEES SHOULD BE UTILIZED. THE RESPONSIBILITIES OF THE RELEVANT

FEDERAL AGENCIES SHOULD ALSO NOT BE REALIGNED. EACH OF THE AGENCIES MAY MAKE UNIQUE AND VALUABLE RESEARCH CONTRIBUTIONS.

NEW YORK STATE DOES NOT SEE THE NEED TO DEVELOP NEW FEDERAL PROGRAMS TO REGULATE SOURCES NOT ALREADY COVERED BY FEDERAL CONTROLS. WE DO, HOWEVER, SEE A NEED FOR FULL IMPLEMENTATION AND FULL FUNDING ON PROGRAMS ALREADY AUTHORIZED. OTHER FEDERAL PROGRAMS SHOULD BE IMPROVED. FOR INSTANCE, THE FEDERAL CONTROL OF PESTICIDES SHOULD PLACE GREATER EMPHASIS ON APPROPRIATE CONTROLS OF PESTICIDES WITH SIGNIFICANT POTENTIAL FOR CONTAMINATING GROUNDWATER. BECAUSE CERTAIN PESTICIDES MAY BE MORE PROBLEMATIC IN DIFFERENT ENVIRONMENTAL CONDITIONS (IN COOLER, MORE HUMID CLIMATES, FOR EXAMPLE), STATES MUST BE PERMITTED TO PLACE MORE RESTRICTIVE CONTROLS TO PROTECT THEIR GROUNDWATER RESOURCES.

MONITORING OF GROUNDWATER QUALITY SHOULD BE CONTROLLED BY STATES, INCLUDING THE DETERMINATION OF WHICH CHEMICALS TO MONITOR AND THE SPATIAL AND TIME FRAMEWORKS FOR SAMPLING. TOO OFTEN, CONSIDERABLE FUNDS HAVE BEEN CHANNELED INTO MONITORING EFFORTS WHICH LOOK FOR EXTREMELY RARE CONTAMINANTS OR WHICH USE A SAMPLING DESIGN WITH LITTLE INTERPRETIVE VALUE. NEW YORK IS CONCERNED WITH THE POTENTIAL IMPLICATIONS OF S.20 IN THIS REGARD. THOUGH MONITORING IS IMPORTANT, IT SHOULD BE DONE WISELY AND IN BALANCE WITH OTHER GROUNDWATER PROTECTION EFFORTS.

IN SUMMARY, NEW YORK STATE SUPPORTS THE OVERALL FEDERAL INITIATIVES AS REPRESENTED IN S.1105, H.R. 791, AND S.20. THE STRONGEST NEED IS FOR EXPANDED FEDERAL RESEARCH, DEVELOPMENT AND DEMONSTRATION PROJECTS WITH DIRECT UTILITY TO GROUNDWATER PROTECTION AND REGULATORY PROGRAMS DEVELOPED AND OPERATED BY THE STATES. STATES MUST CONTINUE TO HAVE THE

PRIMARY RESPONSIBILITY FOR SOURCE REGULATION, DETERMINING FINAL WATER QUALITY STANDARDS, AND DESIGNING WATER QUALITY MONITORING PROGRAMS. THERE IS A SIGNIFICANT NEED FOR FUNDING FEDERAL RESEARCH AND TECHNOLOGY TRANSFER ACTIVITIES AND STATE ACTIVITIES IN THE WELLHEAD PROTECTION, SOLE SOURCE AQUIFER DEMONSTRATION, NONPOINT SOURCE MANAGEMENT, AND LONG ISLAND AQUIFER STUDY PROGRAMS. WE ALSO SUPPORT ESTABLISHMENT OF MINIMUM FEDERAL TECHNOLOGY STANDARDS AT LEAST AS STRINGENT AS THOSE IN NEW YORK. REGULATORY TECHNOLOGY-BASED CONSISTENCY THROUGHOUT THE COUNTRY IS NECESSARY SO THAT THOSE STATES WHICH VIGOROUSLY REGULATE AGAINST GROUNDWATER CONTAMINATION ARE NOT COMPETITIVELY DISADVANTAGED BY INDUSTRIES RELOCATING TO STATES WITH LESS STRINGENT PROGRAMS.

I HAVE PROVIDED MORE DETAILED ANSWERS TO THE SET OF QUESTIONS POSED BY THE COMMITTEE IN THE ATTACHMENT.

THANK YOU.

TESTIMONY PRESENTED

May 17, 1988

before the
Senate Committee on Environment and Public Works
Senator Quentin N. Burdick, Chair

by

Patrick L. Brezonik
Director of the University of Minnesota Water Resources Research Center
and Chair, National Association of Water Institute Directors

and

Archie J. McDonnell
Director, Pennsylvania State University Center on Environmental Resources
and Chair, Committee on Water Resources,
National Association of State Universities and Land Grant Colleges

Mr. Chairman and members of the Committee:

Thank you for this opportunity to testify before this committee on the subject of groundwater research needs. I am Patrick L. Brezonik, Professor of Environmental Engineering and Director of the Water Resources Research Center at the University of Minnesota. My testimony is on behalf of the National Association of Water Institute Directors (NAWID) and the National Association of State Universities and Land grant Colleges (NASULGC), organizations with which you and the committee are familiar. I am the chair of NAWID, which represents the 54 Water Resources Research Centers and Institutes, located at the land grant university in each of the 50 states and several territories.

Groundwater contamination has become the environmental issue of the late 1980s. Scarcely does a week go by without a report in the news about the finding of pesticide residues, high nitrate levels, volatile organic solvents, or toxic metals contaminating yet another well or aquifer somewhere in the country. As the extent and severity of groundwater problems has become known, the need has become apparent for action -- at all levels of government -- to rectify existing problems and to prevent further degradation. New regulatory legislation has been passed or is under consideration both in Congress and in many state legislatures.

Our knowledge about groundwater contamination problems has grown rapidly in recent years, but we also have become increasingly aware that our understanding of the causes of the problems and the methods to solve them is inadequate. Congress has recognized the need for expanded research and development, increased training of professionals to deal with these complex problems, and better dissemination of information on prevention, management, and remediation practices. Congressional concern has resulted in the passage of HR3635 in the House and in a variety of other groundwater bills now pending in the House and Senate.

With regard to S20 and S1105, the bills under consideration in this hearing, I would like to make the following comments. First, my colleagues in the water institute program and I agree wholeheartedly with the overall objective of the bills to establish a comprehensive program of research, development and demonstration on the problems of groundwater contamination and availability. All the specific goals of the bill -- improved groundwater information, expanded and coordinated research, development of improved practices and technologies, assistance to state and local governments. health effects research, a clearing house for information transfer and technical assistance -- are needed and we support these goals.

The Water Institute Directors do not have an established position on portions of the bills concerned with research and monitoring activities within existing federal agencies. However, we do have suggestions on portions of the bills that deal with research and demonstration projects funded to nonfederal institutions by grants, cooperative agreements and contracts. In addition, we believe that the sections authorizing new groundwater research institutes can be improved with relatively modest modifications. We believe these suggestions will strengthen the legislation and increase its effectiveness in promoting groundwater research. Our principal recommendations are listed below. Additional recommendations of language changes to improve the clarity and specificity of some sections of the bills were provided to the Committee staff previously.

1. We are concerned that the timeframe of two years proposed for research on health and environmental effects (in Section 104 of S1105) is unrealistically short. We appreciate the fact that these are pressing issues and that the public deserves timely answers. It is equally important that the answers be correct. Such a short timeframe is antithetical to sound and innovative research, particularly on subjects as complicated as those considered here. It will require the EPA to rely on short-term contracts with consultants and contractors who can provide "quick" answers based on available knowledge and conventional techniques. This approach tends to be much more costly and will be much less informative than a well-planned research effort over a reasonable time period. The National Acid Precipitation Assessment Program (NAPAP) was given a ten-year mandate to study the causes, effects and remedies for this problem. (An interim assessment was required half way through the program.) The environmental and health effects issues involved in groundwater contamination are at least as complicated and difficult to study as those involved in the acid deposition issue. A similar timeframe should be established for groundwater researchers to produce reliable conclusions.

2. The number of groundwater research institutes proposed in the bills (four) is too small to adequately represent the diversity of groundwater issues and problems facing this country and also is too small to involve a significant fraction of the groundwater expertise in our major research universities. We suggest that a minimum of six, and possibly eight regional institutes be established. This modest increase in the number of institutes would increase the likelihood that consortia of universities that join together to form an institute will be clustered within a smaller geographic area. This will facilitate communication and coordination, as well as joint research projects, conferences, and information transfer activities.

3. The basis for selecting locations for the proposed groundwater research

institutes is too narrow. Although this basis is not stated explicitly, the apparent intention is to distribute the institutes based solely on regional geology. We believe this criterion is not sufficient and that consideration also should be given to climate and dominant land-use in a region. Climate greatly influences crop type, irrigation practices and other factors that affect the transport of chemicals from the land surface into groundwater aquifers. Land use patterns obviously determine the nature contaminant sources (both point and nonpoint sources) and their geographic distribution.

4. The Water Institute Directors firmly believe that the proposed legislation to establish new groundwater research institutes should not duplicate ongoing efforts and existing capabilities. Therefore we recommend that the authorizing language be modified to recognize the existing network of Water Resources Research Centers and Institutes (WRRIs) as the logical home for focused programs of research, training, and information transfer on groundwater problems. The WRRI Program has been in existence for 24 years. As described later in this testimony, it has a strong track record of supporting and conducting research on all aspects of water resources, a proven ability in the areas of information and technology transfer, and a firm commitment to continue its important role in training water resources professionals. The WRRI program already is deeply involved in research, training and information dissemination on the issues of groundwater quality and availability.

Although groundwater problems are a nationwide concern, the Water Institute Directors are well aware that the nature, extent, and severity of these problems vary widely among the states. Likewise, the academic talent available to address the problems is not uniformly distributed among all our universities and colleges. In recommending that the groundwater research institutes be identified as a component of the existing WRRI Program, we are not seeking a uniform distribution of the new funds among the 54 existing institutes, nor do we suggest that all 54 institutes necessarily should or would participate as members of consortia in forming new groundwater institutes. Instead, we simply ask that Congress recognize the capabilities and record of accomplishments of the existing Water Institutes and that it not establish a duplicate structure in an effort to address the serious problems confronting us regarding our groundwater resources.

The existing Water Resources Research Institutes are well situated to expand their programs on groundwater if Congress appropriates additional funds through the bills under consideration here. Competition to establish enhanced and focused groundwater programs among selected Water Resources Institutes or groups of Institutes can be handled under the existing authorization or in a slightly modified reauthorization of the WRRI Program. Startup costs and time would be minimal. As a minimum, any new groundwater research institutes established outside the existing framework of Water Resources Research Institutes should be required to operate in close coordination with the WRRIs of states in which the groundwater institute operates so that duplication of ongoing efforts and capabilities is minimized.

5. The federal share of funding for the groundwater research institutes should be at least 75%. In selecting sites for the institutes, consideration should be given to applicants whose states provide specific line appropriations ("hard" money) for the nonfederal match.

6. Long-term continuity is crucial for development and maintenance of high quality research, and we support the concept of stable, long-term funding for the institutes, with periodic (five-year) evaluations to ensure that quality and relevance are being maintained. The legislation implies, however, that once a groundwater research institute is established, it never can be moved elsewhere (although funding may be halted temporarily if an institute does not pass an evaluation to the satisfaction of the EPA Administrator). We believe the Administrator should have the option to re-open the competition for other universities to establish a new institute if an existing institute is found not to qualify for support.

The Water Resources Research Institutes Program and Groundwater Research

The WRRI Program was initiated as a result of the Water Resources Research Act of 1964 and was reauthorized by Congress (over a Presidential veto) in 1984. The program has been managed within the U.S. Geological Survey since 1983. Throughout its existence, the Institute Program has played a leading role in fostering and conducting academic research on a broad array of water resources problems and training of water resources professionals in many disciplines. The prominence and success of the Program belies the modest proportion of total federal outlays for water resources research it has received. The Program has produced a significant fraction of the technical literature in water resources disciplines and has trained thousands of professionals now active in water resources fields. For example, a 1976 study by the Congressional Research Service concluded that over the period 1966-1976 the Program contributed nearly one-third of the published literature on water resources while it received less than one-tenth of the federal appropriations for water resources research. A more recent analysis has not been performed.

More than 38,000 students have received financial support by working on Institute-sponsored research projects, and more than 90% of these students have stayed in water-related careers. During its first ten years, the Institute Program trained about 1,700 students each year. Because federal appropriations for the Program have remained nearly constant while inflation has eroded the value of the dollar by roughly a factor of three, the number of graduate students supported by institute projects has declined to about 600 per year during the mid-1980s. In contrast, the need for trained professionals in water resources disciplines, especially those related to groundwater contamination, is increasing. An October 1986 report by the American Institute of Chemical Engineers concluded that a shortage of scientists and engineers trained in hydrogeology and environmental chemistry will hinder efforts to protect groundwater, and the Office of Technology Assessment has noted that 22,000 professionals will be needed in the area of hazardous waste management by 1995. Expanding programs for groundwater management at the federal, state and local level will require additional trained professionals in coming years. Unless increased federal funds are available to support graduate training in the relevant fields, it is unlikely that academic programs will be able to attract sufficient numbers of students to fill these needs.

It is important to note that the research and training activities of the WRRIs in each state extend beyond the land grant universities at which they are located. Each Institute cooperates with other colleges and universities that have demonstrable research capabilities within each state, and this cooperation includes funding of research projects at non-Institute universities by the Institute's grant program.

Aside from their activities in research and training, the WRRIs play important roles in information dissemination and in coordination and communication between the research producers in academic institutions and the research users in state and local water management agencies. Most Institutes publish newsletters to communicate news and scientific information to water professionals and the public. The institutes sponsor annual conferences, seminars and symposia that bring together water planners, managers, agency technical personnel, consultants, and academic researchers to discuss progress and information needs in their respective areas of responsibility. In addition, the Institutes develop and distribute reports for technical audiences and the general public, and they are developing data bases and computer programs for water management agencies.

An evaluation of the Water Institute Program recently was completed by the U.S. Geological Survey. The evaluation was mandated by PL98-242 and was published as U.S.G.S. Open-File Report 88-85. The report concluded that all Institutes are meeting the objectives of the authorizing legislation and that the Institute Program has used its federal funds in a cost-effective manner to address important problems identified in cooperation with water interests in the states.

As concern about groundwater availability and contamination has grown over the past decade, the Water Institutes have directed an increasing proportion of their activities toward these issues. For example, in the Institutes' current operating year (FY 1987), more than 70 projects directly related to groundwater problems are being funded through the Institutes' grant program (see Table 1). In addition, many other projects are indirectly related to these issues. Including state matching funds, the groundwater projects represent a total financial commitment of $2.8 million. A listing of project titles by state (given in Appendix 1) shows the diversity of problems being investigated by these grants. The amount of funding for individual projects is small -- generally between $10,000 and $25,000 per year in federal funds -- because the amount of funds available to each Institute is small (about $105,000 in federal funds during the current year). Grants of this magnitude typically support one graduate student and some faculty summer salary, and provide small amounts for field and lab expenses. The current scale of federal grants to the Institutes precludes them from supporting multi-investigator and multi-disciplinary projects from this funding source. Such large-scale projects are especially valuable in studying complicated problems in groundwater contamination.

Clearly, the Institute Program has made a substantial commitment to solving groundwater problems, and it could accomplish much more if its funding base were not so small. I would like to note that the currently authorized level of funding for the Institute Program is $10 million per year, which would provide each Institute with nearly twice the level of support it receives under current appropriations. The Institute Program is scheduled for reauthorization in 1989, and draft legislation has been prepared. A provision in the draft legislation (Section 104g) will authorize a new program of competitive grants to fund focused research programs within the Institutes. This mechanism could be used to fund programs of groundwater research to selected Institutes.

Finally, by way of example, I would like to briefly describe some of the activities of the Minnesota Water Resources Research Center on groundwater issues. Because of the limited amount of time available to prepare this testimony and the fact that I am most familiar with the Minnesota program, I will restrict my comments to this program. However, many other WRRIs are involved in similar activities, and some Institutes with larger state budgets are doing much more. The Minnesota WRRC has sponsored research on groundwater topics throughout its existence. A few past projects are of special note. A study conducted in the late 1970s by researchers in the University of Minnesota School of Public Health first called attention to the special vulnerability of the karst region of southeastern Minnesota to groundwater contamination from agricultural activities. This study found evidence of contamination in some wells, and it led to a large number of studies by state and regional agencies on groundwater problems in this area. Similarly, a WRRC-sponsored project to scientists in the University of Minnesota Departments of Geology and Soil Science in the early 1980s detected the herbicide atrazine in certain wells of the karst region. This finding led to a larger state-sponsored study on the relationship between land-use practices and groundwater quality in southeastern Minnesota and ultimately led to a much larger state survey of pesticide levels in Minnesota groundwater.

More recently, the WRRC has completed a project that developed techniques to improve parameter estimates in groundwater transport models. The reliability of parameter estimates is a matter of considerable uncertainty at present and is a limiting factor in the accuracy and usefulness of groundwater transport models. A study also was completed on factors that influence the rates of microbial degradation of the common contaminant pentachlorophenol (a wood preservative) in groundwater aquifers. The Center currently is supporting research in our Department of Agricultural Engineering to improve modeling of contaminant transport through the unsaturated zone of soils. A separate study in our Limnological Research Center is investigating groundwater-lake interactions in the sand prairie region of central Minnesota. This project has implications regarding the effects of climate change on lake levels, as well as relevance to exchange of contaminants between lakes and groundwater aquifers.

Aside from the above examples of groundwater research, the Minnesota WRRC and the Minnesota Groundwater Association co-sponsored a half-day symposium on nitrate contamination of groundwater last fall. The WRRC and the State's Environmental Quality Board sponsored a two-day state conference on Minnesota water resources this past February, and groundwater issues were prominent in both the oral and poster sessions. We were fortunate in having a member of this committee, Senator Durenberger, address the conference on groundwater legislation.

In summary, the Water Resources Research Institutes, of which the Minnesota Center is but one example, are actively pursuing solutions to the nation's groundwater problems. We are encouraged that through the authorities provided in S20 and S1105, Congress intends to call upon the nation's universities to expand research and training programs on groundwater. The Water Institute Program has documented expertise and experience together with the administrative systems to operate expanded programs.

We stand ready to work with Congress to achieve the goal of clean and adequate water for everyone. I will be happy to respond to questions.

Table 1.

GROUND-WATER RESEARCH IN U.S. GEOLOGICAL SURVEY GRANTS PROGRAMS, FY 1987

TOPIC	INSTITUTES		MATCHING GRANTS	
	STUDIES	DOLLARS, THOUSANDS	PROJECTS	DOLLARS, THOUSANDS
GROUND-WATER MOVEMENT	17	627	3	685
GROUND-WATER MANAGEMENT	5	136	0	. . .
IDENTIFICATION OF POLLUTANTS IN GROUND-WATER	5	143	1	356
SOURCES & FATE OF POLLUTANTS IN GROUND-WATER	22	1,003	5	1,007
EFFECTS OF POLLUTANTS ON GROUND-WATER USE	5	212	0	. . .
CONTROL OF GROUND-WATER QUALITY	10	545	1	254
EVALUATION AND ALLOCATION OF GROUND-WATER RESOURCES	6	149	1	279

Appendix 1.

FY87 SECTION 104 PROJECTS ON GROUNDWATER

STATE	TITLE OF PROJECT	FED. FUNDS	NON-FED. FUNDS	TOTAL
AL	Fracture analysis and sedimentary petrography of coastal plain chalks and marls.	17972	26959	44931
AR	Development of a combined quantity and quality model for optimal management of unsteady groundwater flow fields.	19996	19016	39012
AZ	Modification of a two-dimensional saltwater intrusion model for use on a personal computer and calibration of the model for the northern Guam Lens.	12000	0	12000
AZ	Survey of radon in ground waters of the Tucson basin.	8000	10203	18203
AZ	Improving alfalfa salt tolerance via a vertical integration of biotechnology and plant breeding strategies.	10216	15575	25791
CA	Migration of organic chemicals in the subsurface--Mathematical formulation and modeling.	24000	17904	41904
CA	When the well closes(or does not): Public policy issues regarding well closures in California.	14000	17631	31631
CA	Optimal conjunctive use model for managing water supply systems.	19700	22043	41743
CO	Water rights implications of water quality regulation in Colorado.	8000	8000	16000
CO	Injecton recharge in the Denver groundwater basin: Operational alternatives.	18000	18000	36000
CO	Incentives for improving irrigation efficiency (Phase III).	18000	18000	36000
CT	An observation program for validation of a hydrologically coupled surface water and groundwater model.	18971	26304	45275
CT	Study of chemical reactions and physical interactions of groundwater with organics and metals with soils.	11570	33909	45479
DC	Properties of water quality variables in the District of Columbia.	14500	21760	36260

FY87 SECTION 104 PROJECTS ON GROUNDWATER

STATE	TITLE OF PROJECT	FED. FUNDS	NON-FED. FUNDS	TOTAL
DE	The removal of some toxic organic chemicals from contaminated groundwater by photocatalytic oxidation.	13500	18312	31812
DE	Biodegradation of petroleum leaks from underground storage tanks.	10000	18203	28203
FL	Model of porosity development in a coastal carbonate aquifer system.	17000	69368	86368
FL	Determining soil-water seasonal movement.	8500	18828	27328
FL	Field validation of a dispersion model based on geological parameters.	14000	21000	35000
GA	Temporal and spatial variations in the radon content of ground water in the vicinity of the elberton granite batholith of north eastern Georgia.	13000	21471	34471
GA	Optimal reservoir operation schemes.	13000	19500	32500
HI	Atoll groundwater development modeling- Laura area: Phase II	22500	0	22500
HI	Hydrogeology of Pohnpei.	12900	26056	38956
ID	Developing an integrated model for evaluating the economic and ecologic effects of reducing nonpoint source pollution in a palouse watershed.	12739	10665	23404
ID	Groundwater contamination from agriculturally applied pesticides.	8662	14699	23361
ID	Use of multivariate modeling to estimate impacts of groundwater withdrawals on streamflow for the Camas Creek basin.	9758	10589	20347
IN	Movement of microorganisms through the subsurface: Numerical analysis of the threat of biological contamination to Indiana's groundwater resources.	17000	37000	54000
KS	Chemical and isotopic evolution of nitrate contaminated groundwater.	11580	12549	24129
LA	Stable isotope tracing of surface water contamination and cross-formational flow in the Baton Rouge aquifer.	20000	15321	35321

FY87 SECTION 104 PROJECTS ON GROUNDWATER

STATE	TITLE OF PROJECT	FED. FUNDS	NON-FED. FUNDS	TOTAL
MI	The ecological and economic effects of diversions of Great Lakes on wetlands.	15202	22809	38011
MI	Assessment of rural groundwater contamination by agricultural chemicals in sensitive areas of Michigan.	15732	24120	39852
MI	Operational, spatial and environmental water planning and analysis-Phase II	13360	21079	34439
MN	Impact of soil macropores on water and chemical transport to ground water through the vadose zone.	15724	35830	51554
MO	The transport and fate of chlordane in the environment.	19000	31433	50433
MT	Groundwater development potential of abandoned underground mines.	16750	28721	45471
NC	Analysis of stormwater infiltration ponds on the North Carolina outer banks.	27038	29839	56877
ND	Potential for sulfometuron contamination in surface and subsurface water.	12000	19140	31140
ND	Toxicological evaluation of potential ground water contamination from agricultural areas.	14000	26675	40675
ND	Influence of irrigation on the movement of the insecticides, carbofuran and terbufus, through a sandy loam soil to underlying groundwater.	13000	26954	39954
ND	Ddevelopment of a highly sensitive and selective analytical method for monitoring the presence, concentration, and fate of herbicides in groundwater.	16175	28564	44739
NE	Development and evaluation of improved methods of measuring chemical leaching.	21828	12148	33976
NH	Hydraulic mounding under septic systems when considering real time loading.	18810	13940	32750
NJ	Surface and ground water transport of runoff induced heavy metals in the Lakes Bay (NJ) basin. Year 2	17415	30780	48195

FY87 SECTION 104 PROJECTS ON GROUNDWATER

STATE	TITLE OF PROJECT	FED. FUNDS	NON-FED. FUNDS	TOTAL
NM	Field analysis of the role of three-dimensional moisture flow in ground water recharge and evapotranspiration.	0	25000	25000
NM	A stable isotope investigation of vapour transport during groundwater recharge in New Mexico: Phase II	0	24996	24996
NM	Development of agronomically valuable plants with high-temperature, drought, and/or saline tolerances. Phase I	24925	19213	44138
NM	Characterization of deep saline aquifers in the Roswell Basin of New Mexico from lithologic analysis and geophysical well logs. Phase I	20906	6481	27387
NV	Impact of salt flux on root distribution and fractional water uptake.	27249	40887	68136
OH	A study of potential groundwater contamination from selected agricultural pesticides.	23000	22207	45207
OH	Effect of complexation by soluble humic substances on the aqueous chemistry and transport of pesticides.	16460	31579	48039
OK	Cause and effect of rapid changes in shallow ground water quality.	15138	22708	37846
OK	Incorporation of risk in designing water resources.	17808	26712	44520
OR	Laboratory study of in-situ reclamation process for metals contaminated soils.	17974	26992	44966
OR	Geostatistical analysis of pesticide contamination in groundwater aquifers.	11189	19382	30571
RI	Uranium-thorium concentrations in bedrock and surficial materials: Primary sources of radon in Rhode Island aquifers.	13730	41643	55373
RI	Numerical model study of contaminant flow in fractured rock.	18028	35378	53406
RI	Microbial and phosphorus migration in groundwater from seasonally used septic systems.	14000	36760	50760

FY87 SECTION 104 PROJECTS ON GROUNDWATER

STATE	TITLE OF PROJECT	FED. FUNDS	NON-FED. FUNDS	TOTAL
SC	Groundwater resource assissment for the Piedmont region in S. C.	16300	21320	37620
TX	Reuse of municipal and industrial wastewater in agriculture strategies to enhance system selection.	16299	18410	34709
UT	Evaluation of measurement methods for volatile organic contaminants released to groundwater from underground storage facilities.	25000	37462	62462
UT	The use of structure-activity relationships as an aid in modeling the subsurface transport of organic contaminants.	25000	37500	62500
VA	Infiltration facilities: Flow attenuation.	32468	39698	72166
VA	Nitrogen leaching losses for corn produced on the soils in the Chesapeake Bay area as influenced by selected BMP.	24236	66464	90700
WA	Retention of pesticides by alluvial soils in western Washington. (Phase II)	12169	29470	41639
WI	Potential groundwater impacts from management techniques designed to abate nonpoint pollutants to surface waters.	10610	14920	25530
WI	Characterization of groundwater flow in a subbasin with thin soils and fractured bedrock.	8160	11260	19420
WI	Source and concentration of radionuclides and dissolved solids in the sandstone aquifer of eastern Wisconsin.	11035	13870	24905
WI	Phosphorus and carbonate mass balances and their relationships to groundwater inputs at Beaver Lake, Waukesha County, Wisconsin.	9350	11670	21020
WV	Debris flows: A major flood related hazard in the central appalachians.	9204	13450	22654
WY	Stream-aquifer interaction as a possible source of recharge to the paleozoic aquifer along the Laramie Mountains, Laramie County, Wyoming.	20833	31250	52083
*** Total ***		1096169	1647579	******

TESTIMONY PRESENTED BEFORE

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

SUBCOMMITTEE ON WATER RESOURCES, TRANSPORTATION, AND INFRASTRUCTURE

By

Dr. Gerald H. Groenewold
University of North Dakota

May 17, 1988

I would like to thank the Chairman for the opportunity to appear before this subcommittee.

I submit this statement on behalf of the University of North Dakota to provide comments regarding Senate bill 1105 and House bill 791, and to provide this subcommittee with an overview of ongoing groundwater research at the University of North Dakota, and key groundwater issues facing North Dakota and this region.

I would like to express most sincere appreciation to Senator Quentin Burdick for his introduction of S. 1105. I feel that S. 1105 is an extremely important bill which, for the first time, provides for a national program of groundwater research. Very importantly, S. 1105 provides for regionally-focused groundwater research, which is essential for addressing the dramatically varying groundwater conditions and issues which face the various regions of this country.

INTRODUCTION

There has been no comprehensive environmental protection legislation enacted which integrates all the necessary elements of the geosphere, hydrosphere, atmosphere, biosphere, and their interactions. Instead, a progression of environmental legislation has resulted, the components of which address only specific problematic portions of the total environmental system. There is a large body of federal and state environmental protection law which has been enacted over the past two decades in response to increased public awareness of the need for a high-quality environment, and a recognition of the inadequacy of early statutes such as the Refuse Act of 1899.

The most obvious problems were dealt with first and resulted in, for example, the passage of the National Environmental Policy Act (NEPA) in 1969, and the Clean Water Act of 1972. Attention then shifted to the next problem and the Clean Air Act resulted. The continuing shift in emphasis of environmental legislation has resulted in the solution of problems in some areas and the creation of new problems in other areas. For example, surface water protection measures eliminated many direct discharges to waterways, and air pollution protection measures curtailed atmospheric emissions, all of which resulted in an accumulation of pollutant residues which were then "disposed" in "terminal disposal" ponds or were buried with little or no regulatory protection of groundwater resources. Had these environmental statutes been comprehensive, much of the confusion and inadequacy of existing legislation could have been avoided.

Groundwater protection has been only peripherally addressed through implementation of other statutes such as the Clean Water Act and the Safe Drinking Water Act. This works to some extent, more or less by default, because of the intimate relationship in the hydrologic cycle between groundwater and surface water. Table 1 contains a partial listing of federal statutes which either directly or indirectly deal with some aspect of groundwater protection. Enforcement through multiple efforts may be contradictory, is often legally confusing, and has effectively delayed implementation of the ultimate goal, conservation of our groundwater resources and protection of those who use those resources.

There has been no specific "groundwater protection act" for a variety of reasons. Some regulatory authorities maintain that existing legislation in other areas adequately covers groundwater problems. Groundwater, unlike the atmosphere and surface water, is a low-visibility resource. Until quite recently, groundwater has not been as thoroughly understood as other resources. Many key issues have yet to be addressed. Although there is a rapidly-growing body of groundwater research presently available which can be used to support comprehensive groundwater legislation, such legislation cannot be truly effective until key research is completed.

A meaningful groundwater protection strategy must address all sources of pollution. Legislation such as this should, for example, target the use and misuse of chemical substances. Most substances have been designed and produced with specific rational purposes in mind, and, if they are utilized properly, pose little or no ecological threat. A meaningful groundwater protection act must address identification, characterization, and control of the use and misuse of naturally-occurring and synthetic inorganic and organic substances. This would then automatically include the wide variety of agricultural chemicals currently in use, as well as any other industrial chemical.

TABLE 1

Selected Federal Environmental Legislation Which Relates Directly and/or Indirectly to Groundwater Protection Issues

1899	Refuse Act
1969	National Environmental Policy Act (NEPA)
1970	Federal Water Pollution Control Administration reorganized to Environmental Protection Agency (EPA)
1970	Amended Federal Hazardous Substances Act
1970	Clean Air Act Amendments
1970	Resource Recovery Act
1970	Occupational Safety and Health Act (OSHA)
1972	Technology Assessment Act
1972	Federal Water Pollution Control Act Amendments (FWPCA)
1972	Marine Protection Research and Sanctuaries Act
1972	Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
1973	Endangered Species Act
1974	Safe Drinking Water Act
1975	Federal Coal Leasing Act
1975	Amended FIFRA
1976	National Science and Technology Policy, Organization and Priorities Act
1976	Toxic Substances Control Act (TOSCA)
1976	Resource Conservation and Recovery Act (RCRA)
1976	Amended Solid Waste Disposal Act
1976	Environmental Research and Development Demonstration Act
1977	Amended Clean Air Act
1977	Amended FWPCA
1977	Amended Federal Mine Safety and Health Act
1977	Surface Mining Control and Reclamation Act (SMCRA)
1978	Uranium Mill Tailings Radiation Control Act (UMTRCA)
1978	Federal Pesticide Act
1980	Comprehensive Environmental Response, Compensation & Liabilities Act (CERCLA, or Superfund)
1980	Amended RCRA Used Oil Recycling Act
1984	Amended RCRA Hazardous Solid Waste Amendments (HSWA) and the Underground Storage Tank Program (UST)
1986	Amended Safe Drinking Water Act
1988	Draft Amendments of Clean Air Act currently in congressional committees

HISTORICAL PERSPECTIVE

The earth and its interrelated geologic, hydrologic, atmospheric, and biologic systems are the substrate upon which man and other species draw their sustenance. The ability of a society to sustain itself precedes any other activity, and, if it is to remain a viable society, must not compromise the sustainability of future generations. Recent global scale research indicates that thresholds exist for many large-scale earth system phenomena such as soil acidification, soil formation, and groundwater salinity, which, if exceeded, may alter our ability to sustain ourselves at our present or increasing standard of living. Such occurrences, however subtle and slowly occurring, may be the fundamental cause of more obvious social problems. For example, it has been established archaeologically that collapse of the Mesopotamian civilization around 2400 B.C. gradually occurred because irrigation of undrained land caused a widespread rise in the water table and increased soil salinity over several hundred years, which, in turn, decreased their ability to sustain themselves through agriculture. The incapability to recognize and deal with such situations remains a serious problem which today must be addressed by interdisciplinary research between all branches of science and engineering.

Interdisciplinary research between hydrogeological and agricultural scientists and engineers is necessary to understand the continuum between the surface of the earth and the deep underlying geologic materials from which sediments and, finally, soils originate. The earth is a dynamic three-dimensional system upon the surface of which we produce our food. Food production is directly dependent upon the occurrence, flow, and quality of water moving through the earth system in the form of direct precipitation, surface runoff, and subsurface water. Understanding the system as a whole provides predictive insight and subsequent meaningful and enforceable regulatory capability based upon knowledge rather than incomplete perceptions. To date the research emphasis has been focused by discipline. For example, hydrogeologists tend to be conversant with the physical hydrogeologic phenomena and agronomists are conversant with root zone processes but there is little programatic overlap or integration. S. 1105 specifically calls for the use of an interdisciplinary approach to addressing key groundwater research needs.

Adequate water resources have traditionally been a limiting factor in development within North Dakota and the entire northern Great Plains. Until recently, only surface water resources have been fully recognized for their potential in the development of the states within this region. Groundwater, surface water, and atmospheric water constitute the three major components of the hydrologic cycle. The scientific and engineering community addressed surface water and atmospheric water concerns very early in the development of engineering science, but until recently, groundwater has been relatively poorly understood. Most of the engineering and public works failures of history could probably have been avoided if a working knowledge of groundwater had been incorporated in the initial design.

In the northern Great Plains, groundwater is a very commonly misunderstood resource, but has traditionally been important to both rural and urban populations. Groundwater occurrence, flow, and quality must be considered seriously by both urban and rural populations which draw on that resource if they are to reach their potential and minimize problems that result from misunderstanding and misuse of groundwater as a natural resource. Region-specific groundwater conditions and issues are the norm rather than the exception. S. 1105 specifically addresses the need for a national, but regionally-focused, groundwater research program.

Groundwater constitutes the largest reservoir of potentially useful water available to man in the northern Great Plains. In this region, groundwater supplies the baseflow of rivers, streams, and many lakes, and is used extensively for irrigation. Groundwater typically has a long residence time in the subsurface. Consequently, when groundwater pollution problems occur, they may not be detected immediately and persist for long periods of time. A major problem facing municipalities and industries in this region is waste disposal, and the single most important factor in siting municipal and industrial waste disposal facilities is an understanding of the occurrence and flow of groundwater at the site. In addition, there is considerable concern in North Dakota, and throughout this region, about the impacts of agricultural chemicals on groundwater. In recent years, groundwater utilization, contamination, and restoration have become critical issues throughout the northern Great Plains.

COMMENTS REGARDING THE PROVISIONS OF S. 1105 and H.R. 791

Concepts

Proposed legislation is best evaluated in terms of the actual scientific needs addressed. The concepts embraced by a comprehensive groundwater protection strategy should include:

- identification of what is presently known,
- identification of problems,
- definition of the occurrence, flow, and quality of subsurface water,
- understanding of the geologic systems containing subsurface water,
- understanding of the hydrogeochemical relationships between subsurface fluids and the geologic materials, and
- regulation and enforcement based on knowledge rather than unfounded perception.

General Comments

Meaningful and enforceable environmental legislation must be based upon basic scientific and engineering principles, and must contain the scientific terminology to address specific technical issues. Both bills have used this approach, but S. 1105 uses a more comprehensive approach and demonstrates a more comprehensive use of the necessary technical terminology where appropriate. This would serve to eliminate inconsistencies, ambiguities, and loopholes in interpretation and enforcement.

Legislation on technical issues of broad scope need to be founded on knowledge rather than perceptions. There is a large body of knowledge on groundwater science and issues at this time, but because groundwater protection has only recently become an issue, there are numerous fundamental questions which remain unanswered. Research programs focused on specific issues provide the necessary knowledge and provide a basis of support for additional research and regulation. For groundwater, there are certain fundamental issues which can be regulated and enforced now, and there are others which should be investigated further with subsequent promulgation of realistic and enforceable regulations. S. 1105 is the only pending legislation with a fundamental research-first, regulation-later approach. This provision in itself makes S. 1105 the most comprehensive bill.

Groundwater protection poses a monumental challenge because of the low visibility of the resource, and its intimate relationships with surface water and geologic processes. S. 1105 and H.R. 791 both provide a missing link in environmental protection strategy, which must meld smoothly with the myriad of existing federal and state statues such as TOSCA, FIFRA, FWPCA, etc., so that the objectives are not lost in bureaucratic confusion over jurisdictions. S. 1105 addresses this problem most thoroughly.

Specific Comments

Findings

Both bills recognize the same basic issues of the problem, existing data, current related programs, and needs.

Definitions

The definitions should be expanded for both bills because they are the basis upon which the provisions are interpreted. They should be based upon scientific practice. For example, H.R. 791 does not include a definition of groundwater. The definition of pesticide in S. 1105 should be expanded and clarified.

S. 1105 Section 101

This section contains specific provisions authorized for implementation which are based on established principles and significant issues. As such, it is comprehensive and well-designed.

Control Technologies

Both bills contain provisions for management of contamination sources.

Health Effects, Environmental Effects, and Risk Analysis

Health and environmental effects are the driving concern behind this legislation. Risk assessment can only be established after the effects have been determined. S. 1105 addresses the effects extensively, thereby providing a foundation for risk assessment. H.R. 791 provides for risk assessment with no detailed consideration for providing a basis.

Research Institutes

The regional approach to research institutes taken by both bills is appropriate and essential because of regional hydrogeological differences, and the regional nature of problems, such as agricultural chemical contamination. Both bills contain provisions for an interdisciplinary research approach, which is essential to appropriately addressing groundwater research needs. S. 1105 places more emphasis on the function and place of research and the resulting technology transfer, and contains more detail in outlining the program. These provisions of S. 1105 are comprehensive and should help relieve ambiguity.

Assessment of Sources of Contaminants

S. 1105 contains specific provisions and details for identification and assessment of the problem and provides a timetable for completion. It also provides for consideration of the interactions between the saturated and unsaturated zones, which is a very important feature.

National Groundwater Quality Inventory

Both bills contain provisions for a national inventory of quality.

Other Federal Programs

S. 1105 contains provisions for integrating appropriate elements to enhance the efficiency of achieving the goals of groundwater quality protection. It very appropriately addresses agricultural activities through the Agricultural Research Service. A specific objective is to address the effects of agricultural activities on groundwater quality. It contains specific provisions for key parameters and problems faced by the agricultural industry. It encourages bioremediation practices, which promise to be the technology of the future.

Miscellaneous Provisions

H.R. 791 contains a useful provision which directs the Secretary of the Army and Secretary of the Interior to consider groundwater impacts of proposed projects.

Groundwater Radium Contamination

H.R. 791 contains a specific provision for radium removal in certain instances.

Nonpoint Source Management Programs

Both bills contain provisions for nonpoint source programs. This provision is essential because groundwater contamination is typically a nonpoint source issue, which has not successfully been resolved under other statutes.

Enforcement

Both bills philosophically address the problem of groundwater resource protection and differ in their specific approach on different aspects. Enforcement is a key provision to the successful implementation of most environmental legislation. It remains unclear how many of the provisions would in fact be implemented and enforced after promulgation of rules and regulations. S.1105 contains some provision for civil penalties. There may also be reason to include criminal penalties for willful violations which endanger health and welfare.

UNIVERSITY OF NORTH DAKOTA CAPABILITIES AND ORGANIZATAION

The University of North Dakota has established a long-term commitment to addressing critical groundwater research, education, and engineering issues as they have arisen in the northern Great Plains region. Basic knowledge of groundwater flow, occurrence, quality, chemical evolution, groundwater-surface water interactions, and water-contaminant interactions is a necessary prerequisite to intelligent groundwater utilization, maintenance, protection, and restoration, as well as the design and implementation of engineering projects. The University of North Dakota groundwater professionals also have wide-ranging expertise in all key topical areas related to groundwater, and a historic commitment to technology transfer related to fundamental and applied groundwater research programs.

Administration

The groundwater research and development programs in the Energy and Mineral Research Center (EMRC) at the University of North Dakota have been carried out primarily within the Mining and Mineral Resources Research Institute (MMRRI). The EMRC director and Associate Dean for Energy and Mineral Research, Dr. Gerald Groenewold, reports to Dr. Alan Fletcher, Dean of the School of Engineering and Mines.

The advisory council for the Mining and Mineral Resources Research Institute includes representatives from the North Dakota mining industry and institutions of higher education in North Dakota that are actively involved with research on groundwater, mineral, and energy-resource related topics. The ND State Department of Health, U.S. Geological Survey, ND Geological Survey, ND Public Service Commission, ND State Water Commission, and the ND Energy Development Impact Office are also represented on the MMRRI advisory council.

Academic Affiliations

Participation in educational programs, particularly at the University of North Dakota, is a high priority with the MMRRI. The UND School of Engineering and Mines includes accredited programs in geological, civil, chemical, mechanical, and electrical engineering. Other accredited and closely related programs include geology, chemistry, physics, mathematics, biology, microbiology, chemistry, biochemistry, and business. The Department of Geology and Geological Engineering has active undergraduate and graduate programs in groundwater geology in conjunction with the MMRRI. Courses include groundwater geology, advanced hydrogeology, geochemistry, hydrogeochemistry, and various groundwater-focused directed studies. Closely related courses are offered in engineering geology, soil mechanics, hydrology, stratigraphy, and glacial geology. Several EMRC researchers hold faculty appointments whereby they teach undergraduate and graduate courses, and participate on graduate committees. Departmental tenured faculty members routinely work on EMRC research programs. Graduate students routinely participate in projects which result in theses. There is also a tradition of maximum participation by undergraduate science and engineering students in groundwater research programs at UND. S. 1105 and H.R. 791 both recognize the need for training of qualified professionals in groundwater science.

The MMRRI routinely cooperates with other institutions of higher education within this region that are interested in groundwater research. North Dakota State University faculty members have participated in several past and ongoing research programs. Previous and ongoing cooperative groundwater research activities at UND also involve researchers from the South Dakota School of Mines, University of Wyoming, Montana State University, the University of Nebraska, West Virginia University, Pennsylvania State University, and Southern Illinois University.

Federal Agency Affiliations

The MMRRI routinely cooperates with federal agencies on a variety of groundwater-related subjects. The U.S. Bureau of Mines provides the basic allotment grant for the Mining and Mineral Resources Research Institute, and has provided contract funds for several MMRRI groundwater research projects. The U.S. Geological Survey funds the National Coal Resource Data System, which is a fundamental effort to assess the state's coal-bearing strata. These strata constitute many of the key groundwater aquifers in North Dakota. The U.S. Environmental Protection Agency and the U.S. Department of Energy supported MMRRI research on the effects of fly ash and flue-gas desulfurization wastes on groundwater quality in a reclaimed lignite stripmine in western North Dakota. To date, this is the only long-term field study on the subject in the United States. The U.S. Department of Energy is currently funding a major MMRRI field study of disposed wastes from advanced coal conversion processes at field study sites throughout the United States. The Department of Energy is also funding ongoing research focused on the design of liners and caps for disposal sites, evaluation of the toxic element attenuation capacity of waste disposal-site sediments, and biological treatment of waste waters.

State Agency Affiliations

The MMRRI routinely interacts, advises, and cooperates with regional state agencies regarding groundwater and waste management issues. The North Dakota State Department of Health has provided funding and guidance, as well as various in-kind services, for MMRRI groundwater and waste management research projects. MMRRI personnel will be participating in the North Dakota Task Force to study solid waste management problems faced by the state. The North Dakota Geological Survey has routinely participated in, and contributed research support for many groundwater-related thesis projects in conjunction with MMRRI efforts. The North Dakota Public Service Commission has supported research focused on groundwater-related issues in mined-land reclamation. The North Dakota State Water Commission continues to provide guidance and research support through cooperative research programs. The North Dakota Energy Development Impact Office and the Regional Environmental Assessment Program have also participated in, and contributed to, groundwater research programs carried out by MMRRI personnel. The Illinois Department of Energy & Natural Resources is providing support for a field study of disposed wastes from advanced coal processes.

Industrial Affiliations

Awareness of, and response to, the groundwater research needs of the state's and region's industries has remained a mandate of the MMRRI. Cooperating and supporting mining companies include Baukol-Noonan, North American, Falkirk, Coteau Properties, Consolidation, Basin Electric, and Knife River. Additional regional mining company support has come from NERCO, AMAX, ALCOA, Tenneco, Sabine Mining, and Lower Colorado River Authority. Montana-Dakota Utilities, Northern States Power, Basin Electric Power, Otter Tail Power, and Minnkota Power have provided extensive groundwater research support to the MMRRI. Colorado Ute Electric and Ohio Edison are providing support for the study of disposed wastes from advanced coal processes. The International Association of Geophysical Contractors, Amoco, and Shell Oil supported MMRRI research on the effects of seismic blasting on groundwater wells and shallow aquifers in this region. Hydrogeological information critical to the successful installation of the Antelope Valley Station intake structure near Beulah, North Dakota, was provided to Basin Electric and their subcontractors.

Other Affiliations

The Gas Research Institute is currently utilizing MMRRI research personnel as participants on a six-person advisory committee mandated to determine the key groundwater research needs facing the nation's gas industries. The Gas Research Institute is also providing groundwater research support for a major MMRRI research effort associated with the Rocky Mountain 1 underground coal gasification program located at Hannah, Wyoming. The Electric Power Research Institute, through Colorado Ute Electric Power, is providing support for the study of disposed wastes from advanced coal processes being conducted jointly by Radian Corporation and the MMRRI. Environmental Engineering and Services has retained MMRRI to carry out an investigation of the nature and extent of petroleum contamination in the groundwater at the Flying J refinery near Williston, North Dakota. MMRRI conducted an investigation into the effects of the McClusky Canal and Lake Audubon on the Chain of Lakes region for the Nature Conservancy.

ESTABLISHED GROUNDWATER RESEARCH PROGRAMS
AT THE UNIVERSITY OF NORTH DAKOTA

The initial phase of any research and development program consists of establishing a baseline or fundamental characterization of the resource. Only then can meaningful long-term management decisions be made. The University of North Dakota's initial groundwater research program began with a search for a fundamental understanding of groundwater in the northern Great Plains region which is represented by parts of North Dakota, South Dakota, Montana, and Wyoming. Over the last fifteen years, our established research team has addressed key regional issues and impacts on groundwater and groundwater/surface water interactions. The result has been a basic understanding of groundwater flow, occurrence, quality, and chemical evolution in the northern Great Plains, as well as an understanding of the quantitative and qualitative impacts of surface mining on groundwater, the effects of land disposal of various liquid and solid wastes on groundwater quality, optimum design of secure disposal sites, and design of methodologies for groundwater restoration.

The groundwater research programs at the University of North Dakota have evolved to address fundamental groundwater and geological characterization, as well as groundwater contamination problems resulting from waste management practices. One of the key objectives of our groundwater-related research is to fully assess new technologies and practices, and their potential risks to groundwater before these technologies become established. The current groundwater research program at the University of North Dakota has evolved to encompass both basic groundwater studies and waste management, and includes the following specific elements:

- Design of groundwater monitoring systems
- Groundwater resource characterization and evaluation
- Conceptual and numerical groundwater modeling

- Evaluation of the impacts on groundwater of hazardous wastes, oil and gas drilling muds, oil and gas brines, seismic exploration, disposed coal conversion solid wastes, sewage lagoons, sanitary landfills, oil refinery wastes, and coal mining wastes
- Waste disposal site assessment and design
- Characterization of toxic element attenuation capacity of disposal-site sediments
- Evaluation of optimum methodologies for codisposal of hazardous liquid and cementitious non-hazardous solid wastes
- Development of methods for waste leaching characterization
- Waste water treatment
- Remedial action, including biological treatment

ESTABLISHED RESEARCH PROGRAMS AT NORTH DAKOTA STATE UNIVERSITY

North Dakota State University has an established reputation in root zone hydrology, soil science, irrigation, and agricultural processes in general through a research program focused on agricultural productivity. Initial preliminary work with fate of pesticides in the shallow, unsaturated zone has provided a reference point from which to design comprehensive experiments on the actual fate of these chemicals in the deeper subsurface and into groundwater. The Land Reclamation Research Center has defined many of the physiological processes active in the shallow unsaturated zone during reclamation of mined landscapes. These processes constitute an important segment of the hydrologic cycle which can be integrated into the broader scope of groundwater flow, occurrence, and hydrogeochemical evolution in the northern Great Plains.

EMERGING GROUNDWATER ISSUES IN THIS REGION

Agricultural Chemical Impacts on Subsurface Water Quality

The effects of agricultural chemicals on subsurface water quality has recently gained public attention. It has been established through an initial

EPA survey that certain agricultural chemical products can be found in groundwater. The long-term effects of their presence in potable water supplies has not been determined. Integration of specific agricultural root-zone and regional geological/hydrogeological settings must be integrated in research focused on the occurrence, movement, degradation, attenuation, and effects of these chemicals before it can be determined if a potentially dangerous situation exists.

Groundwater Resource Management

Groundwater resources support a major portion of our society, especially in the relatively arid west, where the availability of water dictates the inhabitibility of a given area. High-quality groundwater is a precious commodity which should be managed efficiently for this and future generations if we are to sustain our standard of living. Research must address surface water/groundwater interactions and presently established management policies. Depletion of the Ogalalla aquifer and the Two Forks Dam proposed for the South Platte River in Colorado are only two examples of the water use controversies which will continue to emerge until comprehensive sustainable water management plans are devised.

Siting of Municipal/Industrial Waste Management Facilities

The best waste management plan is a marketing plan wherein resources are recovered and recycled. Where it is not possible to implement such a plan, environmentally acceptable disposal scenarios must be developed. The single most important factor in disposal site design is the presence or absence of subsurface water and its characteristics. In addition, the characteristics of the waste and the geologic setting must be known so that the interactions can be predicted and planned for. An ultimately secure, permanent, isolated disposal site plan is doomed to failure in a wet environment because significant movement will occur through even relatively impermeable materials with sufficient time. Therefore, understanding of site-specific hydrogeologic settings is critical to the design of safe waste disposal facilities.

Investigation and Remediation of Existing Groundwater Contamination

Many severe groundwater contamination incidents have occurred throughout this region and the country. Some of these have been identified under the Superfund program. Comprehensive characterization and ultimate correction of the problems requires the capabilities contained within the research mandates of S. 1105.

Groundwater Depletion and Recharge in Irrigation Areas

When groundwater is used at a rate which exceeds recharge, the resource base is depleted through "mining" of the aquifer. This has occurred in the high plains where approximately half our winter wheat is produced, utilizing irrigation water from the Ogalala aquifer. In addition, agricultural chemicals have been applied to the land surface and shallow subsurface systems with little regard to the ultimate consequences. The result has been stressing of the aquifer system beyond its sustainability threshold. The long-term result will include increased cost of production, and probably other yet-to-be-identified phenomena. The implications of possibly recharging such a system are unclear and need to be addressed.

Soil Salinity

Soil salinity decreases agricultural and natural biological productivity. Salinity buildups occur naturally in some hydrogeologic settings, and as a result of some land use management practices. Understanding and managing the phenomenon requires an integrated understanding of soil-forming processes, hydrogeologic and hydrogeochemical evolution, and agricultural practices. S. 1105 comprehensively addreses these issues.

Acidic Deposition

The nature of acidic deposition from a variety of natural and cultural sources has been well established by the scientific community. The deleterious direct effects on plants and surface water bodies has also been documented. These direct effects have been observed relatively quickly. The more indirect effects of increased acidity in groundwater recharge zones is not well understood, and the manifestations will undoubtedly take much longer to become apparent. In addition, it is also commonly assumed that acidic deposition in the west will be of little consequence because of inherent buffering capacity of the geologic materials. It has not been determined what geochemical changes may be expected if the equilibrium is shifted as buffering capacity is altered. Temporarily immobilized agricultural chemicals may become mobilized in an altered hydrogeochemical system. Much of our agricultural productivity is from lands which are presently slightly alkaline. Productivity may drop if the alkalinity is consumed by acid deposition and problematic geochemical shifts occur. These multidisciplinary questions can be answered only through a focused research effort.

Biogeochemical Thresholds

Biogeochemical thresholds, such as fish reproduction problems resulting from acidification of lakes, have been shown to exist in natural systems. These appear to be subtle broad phenomena with long-term ramifications for self sustaining earth systems such as our agricultural industry. Identification of thresholds and systems through focused research will help us to meaningfully understand and manage our resources.

Technology Transfer and Education

The most sophistocated research and development program will fail if the results are not implemented because they are incomprehensible. A major element of S. 1105 is devoted to technology transfer and education. Only through education will the awareness level of the public be increased so that implementation of research results can be achieved. The University of North Dakota and North Dakota State University both have a longstanding commitment to involving graduate and undergraduate students of science and engineering in basic and applied research projects. Students quickly become the practitioners of tomorrow and they provide one of the most effective ways to diseminate current knowledge.

Evaluation of Conceptual and Numerical Models

General models and assessments, such as DRASTIC (D=Depth to Water, R=Recharge (net), A=Aquifer media, S=Soil media, T=Topography, I=Impact on the vadose zone, C=Conductivity) are of limited use in solving the site-specific problems of the real world. They are, at best, first approximations for very general assessments. Similarly, a great deal of interest has been expressed in numerical computer solutions to complex problems. Problems must be solved conceptually. Computers are merely useful tools to speed up calculations and can not be regarded as substitutes for thinking and field experience. Complex problems in the geosciences and agriculture do not lend themselves to the well-defined limits often observed in the more tightly bounded engineering disciplines. Effective numerical models for the geosciences are probably several decades from realization. Models must be evaluated on their capacity to incorporate real constraints and to predict known field data. Research must be dedicated to obtaining real data on existing problems, which will ultimately be used to test the ability of evolving models to predict what is actually known through field research, before they can be confidently applied to practical problems.

Enforcement

Enforcement of any legislation is the key to its success. If there is not a commitment to enforce it, there is no point in enacting it. Environmental legislation has been frought with enforcement problems. Many of our present problems, especially with respect to groundwater contamination, result directly from government activities ranging from defense research and development to municipal and agricultural spraying to municipal and industrial landfilling. Focused research provides the scientific background upon which reasonable and enforceable regulations can be based.

Summary

University of North Dakota groundwater researchers have already established the general regional characteristics of subsurface occurrence, flow, quality, and chemical evolution of groundwater, and are addressing many critical

TESTIMONY

BY

ROY RAUSCHKOLB
DIRECTOR, ARIZONA COOPERATIVE EXTENSION SERVICE
CHAIRMAN, EXTENSION COMMITTEE ON ORGANIZATION POLICY (ECOP)
NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND
LAND-GRANT COLLEGES

ABOUT

NATIONAL GROUNDWATER QUALITY LEGISLATION
(S. 20, S. 1105 and H.R. 791)

BEFORE

THE SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
MAY 17, 1988

OUTLINE OF TESTIMONY

I. INTRODUCTION

II. THE PURPOSE OF THIS TESTIMONY

III. THE NEED FOR NATIONAL LEGISLATION ON GROUNDWATER

IV. THE NATIONAL PLAN OF ACTION ON WATER QUALITY AND MANAGEMENT BY THE STATE AGRICULTURAL EXPERIMENT STATIONS AND THE COOPERATIVE EXTENSION SYSTEM

   A. WHY AGRICULTURE AND RURAL AMERICA PLAY AN IMPORTANT ROLE IN GROUNDWATER QUALITY

   B. THE NEED TO ORGANIZE AND TAKE ACTION TODAY WITH A SPECIAL EMPHASIS ON PREVENTION OF POLLUTION

   C. GOALS AND BENEFITS OF THIS NATIONAL PLAN

   D. UNIQUE CONTRIBUTION OF THIS NATIONAL PLAN

   E. CURRENT RESEARCH IN GROUNDWATER

   F. CURRENT COOPERATIVE EXTENSION EDUCATION GROUNDWATER ACTIVITIES

   G. RESEARCH NEEDS AS IDENTIFIED BY THE NATIONAL PLAN

   H. EXTENSION AND EDUCAITON NEEDS

   I. COORDINATION WITH FEDERAL, STATE AND LOCAL AGENCIES

   J. THE SCHEDULE AND FUNDING FOR THE PLAN OF ACTION

I. INTRODUCTION

My name is Roy Rauschkolb. I am the Director of the Arizona extension service in the University of Arizona. I am also the Chairman of the Extension Committee on Organization and Policy, which is a national association of Extension Directors.

Mr. Chairman, members of this committee, thank you for this opportunity to testify today on the ground water legislation that you are considering.

II. THE PURPOSE OF THIS TESTIMONY

I am here to testify today to make two points.

First, the nation needs the ground water legislation that the Senate Committee on Environment and Public Works is considering. These bills include at least S.20, S.1105 before the Senate and H.R. 791 passed out of the House of Representatives.

Second, the State Agricultural Experiment Stations, created by the Hatch Act of 1887 and the Cooperative Extension System, created by the Smith-Lever Act of 1914, have developed a National Plan of Action on Groundwater Quality and Management that can help accomplish the goals of your legislation and therefore needs to be incorporated into S.20, S.1105 and H.R. 791.

III. THE NEED FOR NATIONAL LEGISLATION ON GROUNDWATER

There is a need for national water quality legislation to pursue the following goals:

A. Coordinate the research and education activities of the various federal state and local agencies.

B. Ensure that education of the masses of the United States citizens is an integral part of the ground water quality research and ensure that the research results are translated into positive action that protects the ground water quality as well as help citizens achieve the goals of their families, communities and businesses.

C. Expand the water quality research that is currently being carried out under the auspices of the federal, state and local agencies and help define the areas of needed research.

D. Expand the current education effort on ground water quality.

E. Expand the specific water quality research and education role of the Land Grant Colleges created by the Morrill Acts of 1862 and 1890, the State Agricultural Experiment Stations created by the Hatch Act of 1887 and the Cooperative Extension Service created by the Smith Lever Act of 1914.

F. Identify a clear role for the USDA Extension Service and Cooperative State Research Service.

G. Direct States to develop ground water management strategies and groundwater protection programs through the Governors of the states in coordination with the relevant state and federal agencies.

IV. THE NATIONAL PLAN OF ACTION ON WATER QUALITY AND MANAGEMENT BY THE STATE AGRICULTURAL EXPERIMENT STATIONS AND THE COOPERATIVE EXTENSION SYSTEM *

A. WHY AGRICULTURE AND RURAL AMERICA PLAY AN IMPORTANT ROLE IN GROUNDWATER QUALITY

The nation's groundwater is being adversely affected by human activities including the contamination of groundwater by agricultural chemicals applied to soil and crops.

There are an estimated 181,000 industrial surface impoundments (lagoons); 16,000 industrial landfill sites containing hazardous wastes; 18,500 known, active municipal landfills; and 20 million septic systems. Virtually all of these are located in rural areas.

Thirty-four states have identified agricultural nonpoint source pollution as a major source of non-achievement of state water quality goals. Twenty-nine states have identified nonpoint source pollution of groundwater as a major concern and cited agricultural pesticides and septic tank seepage as primary causes.

B. THE NEED TO ORGANIZE AND TAKE ACTION TODAY WITH A SPECIAL EMPHASIS ON PREVENTION OF POLLUTION

Even with concerted monitoring, the extent of groundwater contamination will not be adequately assessed in the near future, nor will be the relative impact of agricultural and other sources of chemicals be confirmed. In addition, institutional arrangements for groundwater allocation and protection are in their infancy.

Substantial efforts must be organized to ensure the future of our groundwater supplies.

Our dependence upon groundwater is substantial. Approximately 86 percent of the total water resource in the contiguous United States is found in underground aquifers. Groundwater supplies about 24 percent of the nation's freshwater and its use is increasing about 4 percent annually.

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* References cited: 1, 2

Of the total water withdrawn, 68 percent is used for irrigated agriculture. Half of the U.S. population depends upon wells for drinking water, with 95 percent of rural households depending solely upon groundwater. Of additional importance, about 30 percent of the nation's stream flow is supplied by groundwater seepage.

Contamination or depletion of groundwater is a crucial concern throughout the nation. Contamination may persist for many years because groundwater moves very slowly and biologically or chemically active zones that can degrade contaminants are scarce.

Thus, prevention is a critical public objective because contamination is so irreversible.

Society has a tremendous stake in preventing groundwater contamination. Chemical usage is common in modern agriculture and other industries, but some can impair the use of groundwater for crop or animal production, or as a domestic water supply.

Public concerns arising from isolated contamination events may eventually result in severe (and possibly unjustified) constraints on use of a wide range of chemicals. In the interest of maintaining agricultural and manufacturing productivity, it is essential to develop procedures to prevent groundwater contamination rather than reacting to contamination after it occurs.

The specific practices that result in groundwater contamination varies by geographical region. Typical groundwater contaminants are inorganic salts, pesticides, nitrates, seawater, gasoline or organic wastes. The nature and intensity of the physical, chemical and biological processes that affect the fate of these chemicals also vary by region. The social, economic and political implications of contaminated or insufficient groundwater also vary according to locale.

Yet, across all these differences, there is clear commonality of the ultimate goals of researchers, extension educators, community managers, regulators, and society as a whole: clean water. Specifically the goal is the provision of an adequate quantity of groundwater of acceptable quality for agricultural, industrial and municipal activities.

C. GOALS AND BENEFITS OF A NATIONAL PROGRAM

GOALS

The general goal has already been stated as the needed quantity of high quality water.

Specific local goals will be identified within each geographical region under the terms of specific funds obligated to particular research projects. These projects will evolve from the issues identified in each region and will focus upon the unique characteristics of each region. Attainment of specific local goals will contribute, each in their own way, to the national goal.

BENEFITS

The benefits of this national program include:

1. A better understanding of the interacting physical, chemical, biological and behavioral processes that determine the environmental consequences of human activities.

2. Minimizing of groundwater contamination resulting from chemicals introduced into the environment by human activities.

3. Better management and safer use of agricultural chemicals.

4. Development of profitable integrated alternative agricultural management schemes, such as integrated pest management, which entail less dependence upon potentially hazardous chemicals and still maintain and in many cases improve profits.

5. In those cases where chemicals are found in groundwater, better prediction of the extent and duration of contamination and development of better remedial measures.

6. Better understanding of the public health implications of chemical contamination of groundwater.

7. Development of economic analyses useful in evaluating alternatives of water treatment, source management, aquifer protection and management techniques.

8. Provide better guidance to social and political institutions that must respond to issues related to groundwater contamination and greater ability to place those implications in the context of benefits accruing from the original use of disposal practice.

D. UNIQUE CONTRIBUTION OF THIS NATIONAL PLAN

The research and extension activities of the Land Grant Colleges in the State Agricultural Experiment Stations and the Cooperative Extension Service have been in place for over a century. These institutions have enabled American agriculture and other industries to achieve unparalleled productivity.

The expertise that exists within this system is not exceeded in any other agency or institution in the world, particularly for issues related to soil, water, plants, animals, agricultural chemicals, and supporting institutional arrangements.

The State Agricultural Experiment Stations and the Cooperative

Extension Services are largely supported by state and local funds. This means that any additional federal dollars are leveraged several times and have a multiple impact.

The SAES and the CES have programs that reach into every county of the nation and have much local support. The CES enjoys the assistance of over 2.5 million volunteers nationwide.

The credibility and long time working relationship of the SAES and the CES make it possible for federal programs to have an impact at the local level and therefore the national level.

The approach of the SAES to CES to local problem solving is based on helping people help themselves and solve their own problems through planning, knowledge and education. This approach works.

Existing research and extension programs, when supplemented, expanded and focused by input of additional federal and state resources can apply substantial expertise and insight to the solution of water pollution problems. Knowledge embodied in the State Agricultural Experiment Stations and the Cooperative Extension will provide the most favorable environment for rapid translation of new concept sin to practice. The Land Grant Colleges also provide education for a majority of agricultural scientists in the United States and many other nations.

E. CURRENT RESEARCH IN GROUNDWATER

1. WITHIN THE STATE AGRICULTURAL EXPERIMENT STATIONS AND USDA COOPERATIVE STATE RESEARCH SERVICE

The areas of groundwater and related research include groundwater, using water of degraded quality, groundwater management, watershed protection, water quality management, pollutant identification, pollutant source and fate, pollutant effects, water in soils and chemicals process.

Other areas of research, which relate more directly to crop and livestock production, but which do have relevance to water quality include: integrated pest management, soil management, fertilizer management, non-chemical fertilizer treatments, irrigation management, crop rotations, cropping systems including non-chemical control of pests, manure handling, range management, economic enterprise analysis, farm management, farm safety, and farmstead design.

In addition to the agricultural production research, there are a growing number of water quality related programs in Home Economics which include: water quality testing, water treatment at the tap, domestic use and disposal of chemicals and minimizing risk associated with chemicals.

Also, research in fundamental biology, soil chemistry, soil physics, fertilizer technology, and other fields provides knowledge valuable in protecting water quality.

2. USDA AGRICULTURAL RESEARCH SERVICE

About 90 percent of the water quality research done by the ARS is devoted to the development of techniques for assessing and enhancing quality of surface water. The ARS programs on ground water focus on nutrients, pesticides, salinity and modeling.

3. ENVIRONMENTAL PROTECTION AGENCY

EPA laboratories with major responsibilities in the area of groundwater quality are the Environmental Monitoring Systems Laboratory-Las Vegas, Nevada, the Robert S. Kerr Environmental Research Laboratory-Ada, Oklahoma and the Hazardous Waste Engineering Research laboratory in Cincinnati, Ohio. The program areas include monitoring, prediction, aquifer cleanup or restoration and hazardous waste engineering.

4. US GEOLOGICAL SURVEY

Groundwater activities within the USGS involve geology, hydraulics, water chemistry, hydrology, biology, geochemistry and groundwater/surface water interactions. This research is designed to understand the processes that control the movement, alteration and fate of toxic substances in groundwater.

5. US DEPARTMENT OF ENERGY

The DOE research on water quality is emphasizing the geochemical processes and transport of energy-related organic compounds and mixtures in the subsurface environment.

6. US AIR FORCE

The major thrust of the Air Force program is to develop methods for predicting the impact of various Air Force activities including the fate of solvents, waste disposal and accidental spills which may result in groundwater contamination. Dioxin contamination from agent orange is a major stress.

7. US ARMY

The objectives of the Army program are to develop cost effective pollution control monitoring systems, to provide environmental and health effects data on Army derived pollutants, and to promote efficient management of environmental quality programs through development of management systems and information data bases.

8. TENNESSEE VALLEY AUTHORITY

Ongoing activities include assessment of problems associated with disposal of power plant wastes on groundwater quality, development and demonstration of methods for disposal of power plant wastes on groundwater quality, development and demonstration of methods of disposal or utilization of fly ash, flue gas desulfurization, coal cleaning waste and fluidized combustion waste, and development of a comprehensive data base and management methods for land application of wastewater treatment sludge.

F. CURRENT COOPERATIVE EXTENSION EDUCATION GROUNDWATER ACTIVITIES

Cooperative Extension has a mandate to work with agriculture, families, small communities, and decision makers. Cooperative Extension also has a well established educational system to acquire and translate information from the research community to the public in all counties of the nation. In conducting educational programs, CES works collaboratively with SAES, other entities within the universities and federal, state and local agencies.

Cooperative Extension has traditionally developed and delivered educational programs that impact water quality. Furthermore, Cooperative Extension has recently taken the following action to concentrate on water quality:

1. May, 1986 - Regional Conference on Groundwater at Chicopee, Massachusetts attracted 135 Cooperative Extension personnel from New England and eastern New York. The program dealt with state programs and challenges.

2. November, 1985 - Conference on Water Quality , Agricultural and Community Concerns in the South at Atlanta, Georgia was attended by over 160 Extension personnel from the southern states.

3. May, 1986 - Regional Groundwater Workshop at Chautauqua County, New York attracted 135 Extension personnel from Pennsylvania, Maryland, West Virginia, New York and the states of the eastern North Central Region, who addressed technical and programmatic challenges of the Cooperative Extension System in dealing with the challenge of water quality education.

4. March, 1987 - The North Central Water Quality Task Force released its report on major opportunities for Extension water quality education programs in the region. Providing safe drinking water and protecting groundwater quality in vulnerable areas were identified. as priorities.

5. May, 1987 - Eight-State Regional Groundwater Workshop in Ames, Iowa was attended by 140 extension professionals who discussed the best ways to program water quality education.

6. October, 1987 - Regional Conference on Water Treatment at Port Jervis, New York emphasized point of use treatment techniques, their availability, applicability and requirements for maintenance to sustain a source of acceptable domestic water.

7. February, 1986 - National Extension Workshop on Water Quality held in Chevy Chase, Maryland was attended by 165 persons from 44 states. This workshop studied successful education programs throughout the nation. These successful education programs will help strengthen the national water quality program.

A national survey of all state cooperative extension services revealed an increased activity in water quality programs and water quality related education efforts, especially in the area of agriculture and natural resources. However, much needs to be done in this area and in the areas of Home Economics and Human Nutrition, Community Resource Development and Public Affairs and 4-H and Youth.

G. RESEARCH NEEDS AS IDENTIFIED BY THE NATIONAL PLAN

There is an immediate need to increase research on four issues:

1. Source and Prevention Issues include identifying the sources of pollution and developing management practices that minimize the potential for groundwater contamination. The prevention areas include some practices developed by the State Agricultural Experiment Stations. These practices are integrated pest management (IPM) and best management practices (BMP).

2. Fate issues concern the physical, chemical and biological processes that act in concert to determine the fate of a water pollutant. Although previous work has identified the general character of these processes, there is currently a lack of adequate understanding of the processes under most field conditions.

3. Remedial Issues include water treatment methods involving microorganisms that degrade pollutants, point of use water filters and community systems.

4. Impact and Institutional Issues include the toxicological, economic, political and social consequences of water pollution. Specifically, this means predicting the impact of water pollution on the food chain, cost/benefit analysis of different water quality strategies, and policy analysis that leads to better water quality protection and maintenance programs.

H. EXTENSION AND EDUCATION NEEDS

A major groundwater program effort will allow Cooperative Extension to meet its responsibilities in a timely manner and to place agricultural impacts in the context of the entire water quality problem. Such programs will be of value to a wide range of audiences. To meet these responsibilities and opportunities, the Cooperative Extension System should:

1. Develop and implement coordinated, inter-disciplinary educational programs about the nature of water resources; their

importance to human health and nutrition, the importance of safe drinking water, the importance of testing for quality, the meaning of contaminant micro-numbers, and the options for keeping water safe or making it safe for use.

2. Develop and implement education programs about the impacts of agricultural and non-agricultural chemicals on groundwater quality; the use and fate of such chemicals, their proper handling and disposal, the importance of soils variability to groundwater impacts, and the health effects of drinking water with small concentrations of chemicals.

3. Develop and implement education programs to increase local government officials' awareness and understanding of the interactions of land use, chemical use and groundwater quality, and their options for addressing such issues.

4. Develop or expand programs to educate the public about the need to conserve water resources through programs for domestic, agricultural, and municipal conservation. Such programs can assist in the development of public strategies to address the problems of decreasing water supplies.

5. Implement procedures to more fully develop and maintain formal linkages with research organizations and agencies. Such linkages would facilitate technology transfer, extension, and education programs and could assure the integration of these programs into groundwater research programs.

6. Develop and implement interdisciplinary groundwater education programs on multi-state or regional basis, to assure efficient program development and delivery. Such coordinated efforts are crucial to the rapid and efficient development of timely programs.

7. Provide for program leadership at the national level to encourage coordinated regional efforts, to assure interstate and interregional communication and to provide timely oversight, advice and linkages.

8. Identify specific shortage of expertise, identify potential sources of such expertise, and develop appropriate strategies and linkages to acquire such resources for Extension education programs.

I. COORDINATION WITH FEDERAL, STATE AND LOCAL AGENCIES

Currently, the SAES and CES are cooperating on water quality projects with various federal, state and local agencies.

The principal federal agencies are the USDA Soil Conservation Service, the US Geological Survey, the US Environmental

Protection Agency, the US Bureau of Reclamation, the USDA Agricultural Research Service and the USDA Agricultural Stabilization and Conservation Service.

The principal state and local agencies include state environmental or water pollution control agencies, state health departments, state agriculture departments, state natural resources departments, local health departments, state soil and water conservation districts and boards, state geological surveys, university based water resources research institutes and irrigation districts.

In several states, the SAES and the CES have been instrumental in developing state ground water protection strategies.

J. THE SCHEDULE AND FUNDING FOR THE PLAN OF ACTION

Over the last several years, the State Agricultural Experiment Stations and the Cooperative Extension Service within the states have been shifting funds and other resources towards more and more water quality efforts. Therefore, the water quality plan of action has already been in place for many years.

It is felt that ten years of intensive water quality research and extension work with some continuing programs thereafter will prevent very serious problems with water quality occurring between now and the beginning of the twenty-first century.

Based on the current and future water quality efforts within the State Agricultural Experiment Stations and the Cooperative Extension Service and the cost of funding scientists to do this work, it will be necessary to provide $15 million per year for additional extension activities and $25 million per year for additional research activities.

This level of authorization is recommended to be made through the USDA Cooperative State Research Service and the USDA Extension Service.

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1) Extension Committee on Organization and Policy Groundwater Education: A Challenge for the Cooperative Extension System

2) Experiment Station Committee on Organization and Policy Task Force on Groundwater Quality: Groundwater Quality and Management

Western Regional Council

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MEMORANDUM

TO: Senate Committee on Environment and Public Works

FROM: Austin Stedham, Chairman
Groundwater ad hoc Committee

DATE: May 13, 1988

SUBJECT: WRC Groundwater Testimony

The Western Regional Council is submitting testimony on the protection and management of groundwater to the Subcommittees of jurisdiction for the hearing record of May 17, 1988 on pending groundwater legislation. We thought you might be interested in receiving a copy of our testimony before that hearing.

The Western Regional Council (WRC) is an organization of the chief executive officers of 49 companies with significant operations in the Western United States, including, mining, utility, financial, construction, transportation, energy, manufacturing, accounting, engineering and other enterprises.

Our testimony focuses on groundwater as a resource in the West, state primacy over groundwater management, a limited federal role in groundwater, and groundwater research legislation.

The WRC believes the states should have the primary responsibility for groundwater management because of physical differences in Western state groundwater, Western state water rights, the authority of State and local government over land use activities, the demonstrated ability of Western states to manage their groundwater, and essentiality of groundwater to Western state development.

Legislation creating a comprehensive federal groundwater regulatory program is neither necessary or appropriate. If Congress enacts groundwater legislation, the federal role should be limited to funding, research and technical assistance to the states. A solution for coordination of present groundwater programs within the federal government can be found in existing law and regulation.

Enclosures

P.O. Box 8144, Salt Lake City, Utah 84108 · Telephone (801) 363-7997

Western Regional Council

STATEMENT
OF
THE WESTERN REGIONAL COUNCIL
ON
GROUNDWATER

MAY 17, 1988

The Western Regional Council appreciates the opportunity to provide testimony to the Senate Environment Subcommittee on Water Resources, Transportation and Infrastructure, and the Subcommittee on Hazardous Wastes and Toxic Substances concerning the protection and management of groundwater. This statement will review the groundwater resource in the West, outline our groundwater position, and analyze pending groundwater legislation.

The Western Regional Council is an organization of the chief executive officers of 49 companies with significant operations in the Western United States, including mining, utility, financial, construction, transportation, energy, manufacturing, accounting, engineering, and other enterprises.

One of the primary purposes of the Council is to establish a balanced viewpoint between the need for a safe and clean environment in which to live in the West, and the need for a healthy and active economy in our region.

P.O. Box 8144, Salt Lake City, Utah 84108 · Telephone (801) 363-7997

Groundwater in the West

In the West, groundwater is not only a critical resource, but a scarce resource, particularly in comparison with other regions of the country. Because of this water scarcity, groundwater is of major importance to the West's economy and basic welfare. Western states depend on groundwater to supply 50 percent or more of municipal water (up to 80 or 90 percent in some states). Groundwater is also the primary source of domestic supply in most rural areas in the West. For irrigation, over 50 percent of the West's use of groundwater is for that purpose, and industrial use is increasing.

Groundwater aquifers in the West vary, but they tend to be smaller than the Midwest or Eastern United States, and are generally isolated from one another according to a recent Western Governors' Association report. These characteristics give rise to the need for more localized groundwater management and control and require more attention to unique local factors affecting groundwater.

Beyond these broad differences, groundwater contamination and its impact depend in part on geologic and hydrologic characteristics, which vary from state to state and from aquifer to aquifer. For instance, large portions of the West are hydrologically characterized by highly alkaline soils, deep water table aquifers with thick unsaturated zones and layers of highly impermeable materials, high evaporation, and low precipitation rates typical of arid environments. The natural alkalinity of many soils in the Intermountain part of the West can serve in many areas as a natural buffering agent, rendering many low pH discharges essentially neutral. Also, the low precipitation and high evaporation rates common in many areas of the West reduce the likelihood of leachate formation.

In many parts of the West, thick unsaturated zones containing areas of rock of low hydraulic conductivity will substantially reduce the risk of contaminant migration into groundwater. Some western aquifers are either contaminated by naturally occurring components or are situated at depths or locations which makes groundwater development for human consumption or agricultural use economically or technically impractical.

Population distribution patterns in the West tend to concentrate intense demand on groundwater resources in very localized regions near major metropolitan areas. This affects management of groundwater, where more intensive management is required for the populated areas than the majority of very sparsely populated areas in which water use is minimal.

A large body of legal precedent concerning groundwater has also evolved in the West due to water being managed as a scarce and carefully allocated resource, and states have water management laws already in place. Western state water laws address both surface and groundwater quantity and quality.

WRC Groundwater Position

The Western Regional Council has carefully reviewed current data, existing state and federal laws and regulations on groundwater, and numerous groundwater proposals and bills. As a result, we have developed the following positions.

State Primacy:

The WRC believes the states should have the primary responsibility for groundwater management and protection. State primacy means that states have historically had, and presently have the authority to implement groundwater management programs which take into account the unique geographic, hydrologic, legal, economic, and social conditions of any individual state. Western states, in particular, are best equipped to deal with groundwater issues for physical, legal, management and economic reasons. These reasons include the following:

1. Physical differences of Western aquifers and other unique factors affecting groundwater in the West, including geography, climate, demographics, geology, hydrology, etc.;

2. The West's unique system of state water rights (prior appropriation doctrine) where water quality and quantity allocation laws are interrelated and cannot be separated from groundwater regulation programs;

3. Traditional authority of local and state government for most land use activities;

4. Demonstrated ability of the Western states to develop and manage groundwater; and

5. The necessity of groundwater for development and expansion of the Western United States.

A more detailed discussion of these five points follows:

1. Western State Physical Characteristics

The section of this statement on "Groundwater in the West" gives greater detail on specific groundwater characteristics on groundwater in the West. Effective management of groundwater requires a local orientation at the state level to recognize differing characteristics such as geologic, climatic, and biotic conditions which impact both groundwater quality and required groundwater use and reflect these unique factors in managing and protecting the resource.

Many features of the arid and mountainous West create a natural groundwater protection system. Such conditions require different approaches to groundwater management and protection than for dissimilar hydrologically characterized regions in other parts of the country and should not be addressed by uniform national groundwater standards and aquifer classification systems.

2. Western State Water Rights

Western states have had water laws in place almost since the original settlement of those states. These laws address both surface and groundwater quantity and quality. The Western states have generally adopted the prior appropriation system of water rights which allows the first user or first to apply for water use the first in right to use it. The rights to use groundwater are considered part of this doctrine.

Under this western system, the issues of groundwater quantity and quality cannot be separated because groundwater quality-related management decisions necessarily affect the quantity of water that is available for a specific use. Simply put, groundwater cannot be regulated without affecting rights to use the water. Therefore, state water rights dictate state management of groundwater. An example of this symbiotic relationship can be seen in return water flows that are often a requirement of western state water law. Under this concept, a person is entitled to a certain amount of water for a certain use, a percentage of which must be returned to the stream or aquifer for reuse. If an irrigator is required to meet a standard before returning the water to the stream, the treatment can often be consumptive and less water returned downstream or to the aquifer for other users. Thus, the "junior" users right has been affected.

The appropriation system of state water rights also requires that water be put to a "beneficial use," and further illustrates appropriate state groundwater management. Each state prioritizes water uses, i.e., drinking water, agriculture, industrial, etc. Under a uniform program of groundwater protection, the situation could arise where a discharger to an aquifer is required to protect an aquifer from further contamination by installing a pump and treatment system. This requires a discharger to obtain a right to pump the water. However, under state water law he cannot obtain a water right permit unless that water is put to a prescribed beneficial use. While it may not be disputed that the quality of the aquifer should be the most important use, the state system must determine that use in each individual situation, otherwise water right conflicts will result.

In regard to federal vs. state groundwater standards, uniform federal standards could require protection of a groundwater aquifer and prohibit any degradation to assure its potential as a drinking water source. A state, however, may have allocated the water for a different use allowing for lower water quality. This would place the federal standard in direct conflict with the state water rights system.

The important point is that states water rights' systems can accommodate water quality and quantity concerns, but they do so on a site-by-site, aquifer-by-aquifer basis. We believe very careful consideration must be given to the western systems of water allocation. Otherwise, a uniform regulatory program may only create a complicated and conflicting set of standards that will be ineffectual and, in the long run, only delay groundwater protection in the Western states.

3. State and Local Land Use Authorities

In many cases, groundwater contamination is occurring as a result of activities on the land surface rather than from the actual use of the aquifer. EPA claims a variety of improper waste disposal methods account for a substantial amount of groundwater contamination. These include: abandoned hazardous waste sites, landfills, septic systems and land application -- most of which are authorized through local or state land use authorities. Therefore, it is only at this level of government that these types of groundwater contamination problems can be addressed.

As a matter of course, State and local laws must take into account risk assessment, competing uses, and management strategies in their decision making process. In the siting of hazardous waste facilities, for instance, such factors are essential in order to provide for the protection of human health and the environment. In the West, in particular, State and local governments must retain adequate flexibility to accommodate two very different kinds of facility siting scenarios.

a. Considerable siting flexibility. A waste treatment and disposal site for organic wastes would best be located at an area removed from a population center and situated over an area where several hundred feet of impermeable soil occurs or over an extremely poor quality aquifer. If sited in this way, the risk to health from such a facility would be minimal and no groundwater protection measures should be required, except to the extent that adjacent or higher quality aquifers need to be protected.

However, if uniform federal standards are set to require protection of aquifers, the facility may be required to comply with costly mandatory protection requirements even though groundwater contamination or degradation may not be physically possible. Given the same design and operational requirements, the facility will no doubt opt to locate near the generators of the waste, even though those generators may be located near populated areas or near a higher quality aquifer. This would offer the greatest risk to the public and be the least environmentally sound option.

b. Limited siting flexibility. In the West, there are facilities which have no choice in their siting and are not amenable to the kind of technology that is normally applied to waste sites. For example, mining and energy recovery can only be located where the resources exist. Wastes from these operations could contaminate groundwater since these wastes typically consist of a very small quantity of low toxicity, naturally occurring elements but which occur in large volumes. However, lining practices suitable for chemical disposal sites are not economically or practically possible. Since minerals and energy development may require use of an aquifer that is also used for other purposes, some compromise between resource protection and use may be necessary. With little flexibility in federal laws, they could virtually put an end to such activities, even though the risk posed may be small compared to the economic benefits. Further, groundwater management options are available to effectively prevent harm to human health and the environment and still satisfy the competing needs of a water-scarce region.

Based on the many state-targeted solutions to groundwater problems of which we have mentioned a few, the Western Regional Council firmly believes states can better establish regulations and develop and manage groundwater protection programs, taking into consideration the unique aspects of each state.

4. State Ability to Manage Groundwater Programs

Western states have been active and innovative in developing and implementing groundwater management programs. We refer the Subcommittees to the Western State's Water Council's (WSWC) report entitled, Western States Ground Water Management for further information. State water allocation programs already take into account competing or conflicting uses. The scarcity of water as a resource in the West has required states to become adept at balancing uses. Any specific groundwater aquifer in the West typically serves numerous groundwater uses. For example, the large aquifer physically located under the City of Tucson, provides water for such various uses as human consumption, agriculture, stock watering, irrigation, industrial, mining, etc. It would not be appropriate to ban certain activities which may affect an aquifer on the basis that a portion may be useful for drinking water when, at another location, the same aquifer is not suitable for drinking water. For instance, EPA's groundwater strategy tends to classify the aquifer into one category. It fails to incorporate local knowledge of resource variability. Many aquifers exist which could fall into a variety of categories and classes depending on the water quality and use at a particular location. States are best able to plan for these present, as well as future uses, and classify and manage each aquifer according to their plans. States can and have accommodated the above situations through the evolving water rights process.

With respect to transboundary groundwater management, states have used interstate compacts as a flexible management tool well adapted to groundwater. Compacts differ based on the characteristics of the aquifer and states' needs. A few of the factors that should be considered in developing interstate compacts include:

- physical properties of the transboundary aquifer;
- accommodation of differing state legal systems;
- different stages of economic development, thus aquifer development; and
- coordinated regulatory authorities.

States have two major incentives for establishing such compacts -- quantitative and qualitative. A state will not only be interested in establishing rights to an equitable share of the regional resource but the quality of that share maintained at a specific level.

Examples in the West of interagency agreements developed to protect interstate aquifers include: the High Plains Technical Coordinating Committee involved in a six-state study (including Colorado and Wyoming) of the Ogallala aquifer; and the states of Washington and Idaho, cooperating to protect the Spokane/Rathdrum aquifer.

5. Importance of Groundwater to Western State Development

Again, we refer you to the section in our statement on "Groundwater in the West" for further detail. Because water means progress in the West, water management becomes an economic question, meaning to decide who will use the water, how and where. According to "State Groundwater Program Summaries" Volume 2 published by EPA, over 90 percent of many Western states' population relies on groundwater for domestic use, over 50 percent of groundwater in many of the States is used for agricultural activities, and industry use is on the rise .

The Western Regional Council recognizes that management and protection of our groundwater has been the key factor in expansion of the West and is presently of utmost importance to the West's economic and social well-being. We simply want to emphasize that because groundwater is a critical and carefully allocated resource, that those states most concerned with its use should have responsibility for groundwater management.

Groundwater Research:

Legislation creating a comprehensive federal groundwater regulatory program is neither necessary or appropriate. Should the Congress enact groundwater legislation, the federal role defined by such legislation should be limited to funding, technical assistance, and authority for research and for state management of groundwater on Indian and federal lands and facilities. The Congress should not attempt to impose artificial uniformity by establishing national standards and mandatory aquifer classification systems. The federal government should not mandate control standards or programs.

If Congress considers groundwater legislation, it should reflect the following concerns:

* Since uncertainties exist regarding some specific groundwater resources in the West, we believe the proper federal role in groundwater management should be to help fund groundwater research.

* Careful and thorough groundwater research should precede and serve as the basis for any additional state groundwater management.

* The nature of the groundwater resource, and other factors affecting groundwater, including geography, climate, demographics, geology, hydrology, etc., are

unique in different areas of the country. Thus, groundwater research activities should be conducted in different regions, including the West.

* Research institutes proposed in several versions of groundwater research legislation could serve as the focus for regionally-based groundwater research.

* There are differing opinions over the question of which agency or agencies should take the lead in groundwater research. We believe the solution can be found within existing law and regulation with coordination between existing agencies with jurisdiction over groundwater.

We recognize, as EPA Administrator Lee Thomas has stated, the need for coordination between the various federal agencies conducting groundwater programs already mandated by law. As previously indicated, this coordination can be accomplished within existing law and regulation.

Congress should not overlook the current federal role in groundwater research. EPA grants to assist states in developing management strategies, monitoring, design controls, and assessing potential contamination should be continued. EPA's technical assistance and research in determining health effects to certain pollutants is helpful to any groundwater protection program. The role of the U.S. Geological Survey should be maintained or expanded. Its efforts are key in providing hydrogeological background information, technical assistance and other data to the states.

Federal and Indian Lands:

As previously stated, any federal groundwater legislation should ensure state authority for management of groundwater on Indian and federal lands and facilities. Federal lands constitute from 29 to 87 percent of lands within Western states. The WSWC has documented the fact that some of the worst groundwater contamination problems in the West are the direct result of federal activities on federal lands. The federal government should provide the funding and resources necessary to clean up or prevent contamination of groundwater on federal and Indian lands, consistent with state regulations and programs.

Groundwater Quality Standards:

Congress should not attempt to impose uniformity of the groundwater resource by establishing national standards and mandatory aquifer classification systems. As previously mentioned, a large amount of groundwater in the West is used for agricultural purposes and an increasing amount is being used by industry. Any uniform or minimum drinking water standard could require protection or cleanup of a groundwater aquifer leading to a differential standard conflict between Western state water laws governing use and allocation, as well as existing state groundwater quality statutes and regulations. A uniform non-degradation standard would simply be inefficient and unworkable.

Review of Pending Legislation

S. 20:

S. 20 mandates that EPA and the USGS provide information and guidelines for the setting of criteria, monitoring and management programs, state assessments, etc. This position may disregard existing Western state groundwater management law already in place. The question also remains unanswered in S. 20 as to whether such factors as geography, climate, demographics, geology, hydrology, use density, and water rights unique to the West are addressed.

Section 4 of S. 20 calls for EPA to arbitrarily establish criteria for 100 contaminants. This specific number seems unrealistic based on the lack of current research on that many potential groundwater contaminants. There are some contaminants for which it is important to initiate cleanup programs. However, the mandate of 100 contaminants is based neither on scientific research nor any analysis of potential health or other benefits. It also totally ignores consideration of cost benefits. As stated previously, the WRC opposes Congressional action to establish national standards.

Strict guidelines for criteria-setting would also seem to contradict S. 20 claims to leave the basic responsibility and authority for groundwater management with the States.

Section 5 of the bill does provide some flexibility to states regarding contaminants. That provision does not set a number on the amount of groundwater contaminants states must address although they are mandated to establish numerical standards in section 5 (a).

We offer a suggestion for Section 4(e) of the bill. That section establishes an Advisory Panel with at least five representatives of state agencies. A proportionate number of representatives should be from the Western United States to represent our region's perspective of groundwater issues.

We note also that under section 5 (b), allowances are made for special groundwater systems that can be defined by a "specific geographic area or geologic structure." We appreciate the realization of the various uses of groundwater that can be used to establish "stricter or less stringent " standards than those primary drinking water standards under the Safe Drinking Water Act.

Section 5 (d) requires states to establish specific procedures for determining compliance with their groundwater standards. We approve of states enforcing their own laws but object to EPA describing procedures and methods for determining compliance. The local and/or regional characteristics of groundwater would also apply to compliance procedures and methods and should remain under state and local governmental control.

Section 5 (e)(3), requires EPA to review groundwater standards proposed by states. This seems an unnecessary and inappropriate intervention into a state priority matter, particularly in the case of Western states with existing groundwater programs.

Section 10 in S. 20, provides $550 million for five years, mostly in grants, to assist states in managing their own groundwater programs. While the WRC does not take a position on specific funding levels, some states may not have the resources necessary to address all their own groundwater needs. We are, however, not sure S. 20's system of federal grants is appropriate. Although the two Subcommittees have stated that much of the funding for groundwater is already appropriated, it would seem the stated use for the funding, i.e. research, would be at cross purposes with funds like the $110 million per year used by USGS for groundwater data collection. We also fail to see the real need for demonstration projects. Much of the purpose for grants in the bill would be for state-conducted research that would be more appropriately handled in a more narrowly-designed groundwater research bill.

S. 1105 and H.R. 791:

As we have already discussed, research should be conducted before regulation is implemented. Federal groundwater legislation should be limited to funding, technical assistance, and research.

In both H.R. 791 and S. 1105 we endorse enhanced research programs for groundwater data collection, and improved support for groundwater research and technology transfer.

We do object, however, to language in H.R. 791 that uses words to denote the federal role as one to, "manage, protect, and remedy." This language implies a federal regulatory orientation for groundwater programs and is contrary to language under Section 202 (points 7 & 8) of H.R. 791, where state primacy over groundwater protection is confirmed.

We oppose the suggestion in H.R. 791 of federal standards through the requirement for 60 risk assessments to be conducted within 36 months. We preferred language in the original H.R. 791 which was limited to assisting the states in their groundwater efforts through the U.S. Geological Survey. The substitute H.R. 791 may also be written in such a way as to allow for programs which the states will probably find difficult to enforce or fund.

We also object to language in Section 104 of S. 1105 that could expand on existing requirements in CERCLA (Superfund) and the Toxic Substances Control Act (TSCA) for industry to test chemicals because they are "known to occur in the ground waters of the United States." The bill does not require that a risk to the public be known or even reasonably anticipated. Such justification for this type of research is not sufficient or warranted.

The nature of the groundwater resource suggests state and regionalized research. Therefore, we support the provisions in both H.R. 791 and S. 1105 for regional research institutes. There is no justification, however, to specify five institutes in H.R. 791 and four in S. 1105. There are some 54 research institutes now in existence. Some coordination may be possible to avoid duplication of research and use of funds. We do believe, however, that these existing institutes represent a reservoir of leadership and facilities that can well be utilized for localized groundwater research purposes. We believe that funding and research should include institutes in the West to address the unique characteristics of groundwater in our region.

Finally, we support the intent in H.R. 791 and S. 1105 to coordinate research plans for groundwater within existing law and regulation. If a lead agency is required, the USGS is already conducting groundwater research. With help from EPA, Health and Human Services, Agriculture and other concerned agencies, the USGS could enlarge its role without significant new sources of funding.

S. 2091:

This legislation was introduced by Senator David Durenberger (R-MN) and is a "comprehensive strategy to protect and restore groundwater."

The bill calls for a strict non-degradation standard in the quality of groundwater, stating its purpose to "protect and enhance the physical, chemical and biological integrity of the Nation's groundwater resources and to ensure that such resources are not degraded in any way." The Council opposes such a standard based on our previous statements about broad variances in groundwater uses and characteristics. In addition, we believe non-degradation is an unrealistic, unworkable and inefficient goal given our lack of scientific data, limited resources and variety of uses and needs. Finally, in most cases, strict implementation of a non-degradation standard is simply not necessary to protect groundwater for current, or even potential future uses.

In connection with nondegradation, S. 2091 includes new authorities for corrective action at sites of groundwater contamination. This requirement changes the standard of no degradation of groundwater to an upgrade of groundwater, thus turning the groundwater programs from protection and management to rehabilitation, similar to Superfund.

Senator Durenberger's bill authorizes the U.S. Geological Survey to conduct a national assessment of groundwater quality and funds four groundwater research institutes at universities across the nation. We approve of the expansion of the USGS role in assessing groundwater. This seems a logical extension without an additional large expediture of funds. As has been stated, we also approve of using the expertise located in our Western universities on groundwater issues. We simply add the caveat that part of the research be located in the West to address the unique characteristics of groundwater conducted here.

For reasons previously outlined, we disapprove of provisions in S. 2091 to impose stringent federal standards, correction standards or requirements on existing groundwater contamination or sources of contamination. Such standards would undermine existing state and local efforts and programs.

In conclusion, our remarks have been intended to assist the Subcommittees to determine the best approach for an efficient and effective federal and state partnership to conduct existing groundwater management and protection programs. We wish to reiterate that such programs in the Western states are similar in their groundwater allocation and quality protection goals. Yet, individual programs may differ markedly from one another in structure and implementation. We strongly urge that any proposed groundwater legislation continue to allow these individual states to develop new groundwater programs and enhance existing groundwater programs that accomplish both necessary protection and allow the necessary flexibility that differing conditions in each state require. Thank you very much for your consideration of our views.

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